TONE CONTROL
SKYRIDER
PITCH CONTROL
CRYSTAL
OUT IN
A.V.C.
OFF ON
CRYSTAL PHASING
R.F. GAIN
EXPANDER
A.F. GAIN
REC. SEND
B.F.O. INJECTOR

# COMMUNICATIONS RECEIVERS

## THE VACUUM TUBE ERA: 1932-1981

## 4th EDITION

By Raymond S Moore

# ABOUT THE AUTHOR

Ray Moore worked thirty-five years in the electronics industry, starting out at Hytron for ten years manufacturing vacuum tubes until transistors came along. Then came stints at Raytheon Semiconductor, Raytheon Computer Products, Crystalonics, Semicon, and finally back to Crystalonics, by then a division of Teledyne, where he spent his last ten working years, winding up as Executive VP.

Now 73, Ray lives in La Belle, FL, a beautiful little town on the Caloosahatchie River surrounded by huge, live oak trees, citrus groves, and cattle ranches. His wife, Marty, is his "gal Friday." She types, edits and is a "go fer" for Ray and gently prods him on his way.

He is an avid tennis player and competes on the USTA Super Seniors circuit in Florida in the 70's division. Also a sailing enthusiast, he sailed from Key Largo to Bimini in the Bahamas, across the Gulf Stream in their 23 foot sailboat in June, 1996. No, Marty wasn't on the boat. She had more common sense and flew across in a seaplane.

Another passion is DX listening on the standard MW broadcast band where he has taped or verified some 110 countries. He does all his listening on his custom loop antennas which cover the entire range from 150 kHz to 25 mHz. He has optimized the antennas and perfected the techniques for high precision direction finding. A couple of years ago a new station was widely heard on 1557 kHz on the West Coast and speculation placed it from New Zealand to the Phillipines. Ray was hearing it in Florida and took dozens of bearings on it and plotted its location on a great circle path between Kiribati and Marshall Islands, through the Solomons, across Papua. New Guinea and into Australia's Northern Territory. From a distance of 7133 miles, Ray's path came within 70 miles of the actual location of the station on Majuro, Marshall Islands. Ray is also a former ham with the call K1DBR.

Ray started working on the first edition of *Communications Receivers* after his retirement in 1986 and published it in 1987. Now that the fourth edition of *Communications Receivers* is completed he plans to continue his quest for the ultimate receiver and develop his loop antennas and publish several more related books. He is also the author of another popular book, *Transmitters, Exciters and Power Amplifiers*.

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# COMMUNICATIONS RECEIVERS

## THE VACUUM TUBE ERA: 50 GLORIOUS YEARS

## 1932-1981

FOURTH EDITION

BY

RAYMOND S MOORE

RSM COMMUNICATIONS
LA BELLE, FL, USA

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RSM COMMUNICATIONS
P O BOX 27
LA BELLE, FL 33975

# PREFACE

A little over a year ago in the preface to *Transmitters, Exciters & Power Amplifiers* I said I was tired and wanted to get on with the fruits of my retirement, tennis, cruising and more time with my wife. Well, three months after publishing *Transmitters* we discovered a beautiful home in Southwest Florida in rural LaBelle. So, we bought the place in spite of my vow that the home in Key Largo was the last move I was ever going to make. We closed on the new house in September and finally moved here Christmas Eve after commuting between the two homes weekly. We eventually sold the Key Largo home and the sailboat - so much for cruising. Just as we were finally settling in, we ran out of copies of *Communications Receivers*. Being a perfectionist, and a masochist, I decided to completely redo the book rather than do another reprint of the third edition. I like the result.

I "retired" eleven years ago in 1986 and published the first edition of this book ten months later. The printing consisted of 500 copies run off by the local print shop. It was delivered in 56 boxes of individual pages which we than had to collate and staple. We only sold the book to individuals but ran out within a year and had it reprinted commercially and started to accept orders from dealers, most of whom are still with us and to whom we are very grateful for their continued support.

We think we have finally learned how to reproduce photos satisfactorily. New, and very expensive, scanning techniques make it possible to publish photos of a quality which we could only dream of a few years ago. This fourth edition also features:

- new typesetting on word processor
- extensive revisions, corrections and new information
- nineteen more pages
- index by model number or name
- added antenna input and audio output characteristics to the data

## GUIDELINES

The guidelines, almost all of which have been violated occasionally, remain the same as for previous editions.

1. Super heterodynes only.
2. Manufactured in the USA.
3. Offered for sale to radio amateurs and the general public either directly or though surplus channels.
4. Vacuum tube receivers only.
5. Must have a BFO.
6. Continuous tuning - excludes fixed tuned and switch tuned receivers.
7. Must cover all or part of the high frequency bands.
8. Advertised or promoted for communications use.

Meanwhile, the search for the ULTIMATE RECEIVER goes on. Since this is the "final and ultimate" edition of this book we can move on as time allows. We have all the material and research done for three more books:

*Communications Receiver Album,* consisting of full page photo displays of the 100 greatest receivers ever made, mostly half page or larger photos.

*Solid State Receivers, 1956-1998.*

*Designing The Ultimate Receiver,* philosophy and circuitry required to obtain the ultimate performance from a receiver with examples from the greatest receivers, vacuum tube or solid state.

## ACKNOWLEDGMENTS

Acknowledgments will appear at the end of the book as space permits since I must give these first 48 pages to the printer a month early while I'm still working on the remainder of the book.

SECTION I

# HISTORY OF THE COMMUNICATIONS RECEIVER

A revolution in the receiving equipment used for communications and monitoring work on the high frequencies occurred during the first half of the 1930's. The following table compiled from *QST* station descriptions shows how the type of receiver changed in just five years.

| | Superhets | Homebuilt |
|---|---|---|
| 1931 | 11% | 78% |
| 1936 | 77% | 20% |

The first rudimentary commercial communications receiver was the Hammarlund "Comet" introduced late in 1931. An improved "Comet Pro" followed in the spring of 1932. A more advanced receiver, the National AGS appeared in July, 1932. Radio Constructors Co (see Sargent) and Hatry & Young perhaps have legitimate claims to being first, but their receivers were not as widely known and accepted as the Hammarlunds.

But these receivers were crude compared to the communications receivers we became accustomed to during the next 40 years. They lacked direct calibration, bandswitching, IF filters and the indispensable "S" meter.

Perhaps the first complete, modern communications receiver was the RME-9 which was introduced in December, 1933. It set the standard for most of the communications receivers built well into the post-World War II period. It had a directly calibrated airplane dial with mechanical bandspread, bandswitching, an "R" meter, RF amplification, AVC.

It is interesting that RME continued to make this same receiver, circuit-wise, until 1953. The RME-50 which was last manufactured in that year had exactly the same circuit configuration as the RME-9, RF amplifier, mixer, HFO, two IF amplifiers, detector, BFO, two audio amplifiers and a rectifier. Indeed, the RME-50 even had the single knob tuning with mechanical bandspread of the RME-9. RME had gone to the two dial, electrical bandspread system with the RME-9D in mid-1934 but returned to mechanical bandspread for good in 1941 with the RME-41 and -43 models.

What triggered this revolution which brought the communications receiver from the dark ages to the mid-twentieth century in less than five years?

Much of the impetus came from the growth of amateur radio and from the American Radio Relay League. In June, 1932, James Lamb, technical editor of the ARRL's publication, *QST*, published an article in *QST* which established the guidelines for the communications receiver of the next several decades.

The article, "What's Wrong With Our CW Receivers?", showed that the broad tuning and unstable regenerative receivers then used by most amateurs had not kept pace with the comtemporary crystal-controlled and well-filtered transmitters.

Lamb's next article in the August, 1932, *QST* described an advanced receiving system. The article, "Short-Wave Receiver To Match Present Conditions", was subtitled "Constructional and Operating Features of the 'Single-Signal Superhet.'" It covered the basic receiver principles of selectivity, frequency stability and sensitivity and gave techniques and circuits for achieving them. He used a crystal filter for single-signal CW reception and showed how to stabilize the high frequency oscillator. The principles of quiet and electrically stable RF amplifiers were also covered.

By December, 1932, an advertisement for the first commercial receiver with a crystal filter appeared and within a year Lamb's recommendations were standard in better quality receivers.

At the same time, shortwave reception was becoming a craze with the general public. This spurred developments in the broadcast receiver industry. Many receivers during this period had at least one shortwave band and some were quite advanced with features not found in the few available communications receivers. Single dial tuning, direct calibration, band-swithcing, AVC, RF amplification, even double conversion, were used in broadcast receivers. This demand for efficient, convenient shortwave reception accelerated the development of better components and circuits which were also useful to the communications receiver designer.

Indeed, a number of the communications receivers of the mid-1930's were little more than broadcast receivers repackaged in metal communications-type cabinets. The Hallicrafters Super-7 (c. 1935), for example, had a small seven tube chassis which occupied only half the impressive cabinet.

During 1933 and 1934 a dozen manufacturers turned out communications receivers. We have already mentioned RME, National and Hammarlund. The last of the "Big Four" manufacturers of the 1930's, Hallicrafters, didn't bring out their first superheterodyne communications receiver until the fall of 1934. This was called the Super Skyrider, meaning superheterodyne, to differentiate it from the original Sky Rider which was a regenerative TRF. Other companies were McMurdo Silver, Lincoln, Ross, Postal, Sargent, Patterson, and RCA.

Communication receiver development accelerated and reached a peak in 1935. Public interest in shortwave reception also continued to surge toward a peak and the result was the availability of higher performance components making for higher performance receivers. Improved insulation for bandswitches and coils, metal and acorn tubes, which reduced input loading for efficient RF amplification and iron core IF transformers all were designed into receivers during 1935.

Hallicrafters was particularly dynamic in adopting new components, twice revamping their line in 1935. In January the company replaced the original Super Skyrider with three new models, the S4, S5 and S6, differing from each other only in frequency coverage. These were replaced in September with the SX-9 Super Skyrider, the first communications receiver to use metal tubes and iron core IF transformers. The Super Skyrider series went on to include the SX-11, SX-16, SX-17, SX-28, and the SX-28A which was produced until 1946. Beginning in 1936 Hallicrafters added additional models to fill out their line which included the $29.50 Sky Buddy at the low end and the Super Skyrider at the high end.

Other new receivers to appear in 1935 were the McMurdo Silver 5D, RCA AR-60, Patterson PR-16, Breting 12, Sargent 20 and RME-69. Tobe Deutschman marketed two communications receiver kits. One covered the amateur bands only while the second was general coverage. Both used the "Tobe Tuner" pre-wired front end.

Outside of improved components the communications receiver remained essentially unchanged from the RME-9 of 1933 until after World War II. Although single sideband, lattice filters, double conversion and most of the other modern refinements were available and in use by the communication companies, they were not used in amateur communications receivers.

Everyone made the same receiver dressed a little differently. Almost every communications receiver from 1933 to the late 1940's had one or two RF stages, a mixer, high frequency oscillator, a crystal filter, two or three IF amplifiers, a second detector, BFO and a couple of stages of audio. At the low end of the line they eliminated the RF amplifiers, combined the mixer and HFO and dropped down to one IF amplifier.

The major receiver manufacturers could be divided into two groups in the 1930's. One group, led by Hallicrafters and including RME and Howard, specialized in giving the most features per dollar. They did this by using mostly purchased, standard components, especially the high-volume, low-priced parts developed for the all wave broadcast sets.

The other group of manufacturers which included National and Hammarlund custom designed and manufactured the key components for their recivers. This included tuning capacitors, IF transformers, coils, band changing systems and tuning mechanisms.

National was particularly protective of their quality image. When, in 1937, they brought out the medium-priced NC-80 series they were apologetic. Their advertisement said, "Most amateurs do not need to be told that when a communications receiver is to be sold for as low a price as the NC-80X, it is necessary to make compromises."

The Hallicrafters Sky Buddy at $29.50 was a big seller during the depression ridden 1930's. Several models were manufactured from 1936 to 1942 and over 15,000 were built. It was the basic superheterodyne circuit stripped bare. The tube count was reduced to five (six in the S-19R) by using multi-purpose tubes and eliminating the RF amplifier and one IF amplifier. There was no filter. Although the insides were minimal, the outside looked like a real communications receiver with its large dial and multitude of knobs and switches. And, it could perform when conditions weren't too tough. Many a ham and SWL has fond memories of the Sky Buddy.

At the other end of the scale the National HRO seemed doomed as an anachronism before it ever appeared. Electrically, the HRO was almost the same as the RME-9 with one additional RF amplifier. But, it used plug-in coils, did not have direct calibration and had a separate power supply. Yet, it became one of the most successful receivers ever introduced. remaining in production basically unchanged until 1949 and with modifications until 1964. What it had was uncompromising mechanical design. The famous PW dial and its gear system, the custom four-gang variable capacitor and the four-gang plug-in coil system, were all a reflection of the mechanical engineering background of James Millen, National's chief engineer.

Another top-of-the-line receiver which lasted well into the solid-state era was the Hammarlund Super-Pro. Hammarlund started design of the ultimate receiver, the Comet Super Pro, to replace the Comet Pro, in 1933. Like National, their design approach was uncompromising. They designed a unique bandswitching mechanism, special IF transformers with variable coupling and a custom twelve gang tuning capacitor. It was scheduled for release in early 1935. The project did not go smoothly, however, and it was 1936 before the receiver was ready for delivery. It turned out to be the most long lived of all receiver designs. Minor changes occurred in 1937 (SP-100), 1939 (SP-200), 1945 (SP-400). In 1949 (SP-600) double conversion, turret coil changing and an internal power supply were added. The SP-600 continued to be sold until 1972.

Perhaps, the most ambitious communications receiver manufactured during the pre-war years was the Hallicrafters DD-1 Skyrider Diversity. It was a 25 tube dual diversity receiving system - two separate receivers on a single chassis with a common HFO. A separate power supply sat on one side of the receiver and a separate audio chassis on the other, all usually shown atop a hugh Jensen console speaker. At a time when the SX-17 Super Skyrider cost $137.50, the DD-1 went for $550. Only about 100 DD-1's were built during 1938 and 1939. It never caught on with amateurs because it was a poor CW receiver.

In 1940 Hallicrafters introduced the last of the Super Skyrider models, the SX-28. This was their ultimate refinement of the conventional, straight superheterodyne. The SX-28 used 15 tubes and included the Lamb noise silencer circuit. The receiver was used extensively by the military and Hallicrafters produced 50,000 during World War II. The SX-28A, with some minor refinements, was produced until 1946 when Hallicrafters introduced their post-war models.

All-wave broadcast receivers reached the height of ostentation and complexity in the second half of the 1930's. The zenith of the genre was in 1937 when E. H. Scott introduced his Philharmonic XXX, a 30 tube, chrome plated set which full page ads proclaimed to be the "World's Most Powerful Radio." At the same time McMurdo Silver touted his 21 tube Masterpiece VI as the "Finest Receiver Ever Built."

To complete the story of the 1930's, we must mention some of the people involved with the development of the communications receiver. McMurdo Silver may have been the most familiar name of the '30's. He was president of Silver-Marshall Inc which went bankrupt in 1931. Then he became president of McMurdo Silver, Inc, which lasted until 1938 when the company went bankrupt. In 1938-39 he was an engineer for E. I. Guthman. During all this time he was a prolific writer for the popular technical magazines of the time, appearing almost monthly with an article about his latest receiver design.

Bill Halligan of Hallicrafters and E. H. Scott were frequently pictured in their company's advertisements. Halligan was a gregarious man who was often photographed at radio conventions. Karl Miles and Kendall Clough of Hallicrafters engineering wrote a number of articles about new technical developments. James Millen of National was another prolific writer and Lloyd Hammarlund was often quoted and pictured in magazines.

During World War II the major receiver manufacturers worked around the clock producing communications equipment for the armed services. Hallicrafters turned out tens of thousands of SX-28, S-29 portables, S-27/S-36 (BC-787) VHF receivers, and SCR-299 communications systems containing the BC-610 (HT-4) transmitter and the BC-342 receiver.

National and Hammarlund produced versions of their top receivers, the HRO and Super Pro, for the military in large quantities. RME turned out signal generators and shipboard communications equipment. RCA manufactured thousands of AR-88's, most of which wound up in England and Russia.

## THE FIRST POSTWAR DECADE

With World War II the communications receiver business changed forever. Gone were Howard, Breting, Patterson, RCA, Sargent, Meissner and Guthman. Gone were the highly visible engineers and entrepreneurs. Big business methods prevailed and receivers became the product of engineering teams working in anonymity in obscure laboratories. Also, communications receivers became a minor part of the business at the surviving companies, such as National, Hammarlund, and Hallicrafters. The money was in the military business.

During the war communications receiver manufacturers teased us with hints of secret wartime developments that would dramatically improve receivers after the war. What a disappointment? The postwar sets were the prewar sets not even thinly disquised. About the only wartime developments utilized were miniature tubes (6AK5, 6AG5) used in late 1946 in the Hallicrafters SX-42 and the Collins 75A and the permeability tuned oscillator (PTO), also in the 75A. National's HRO-5 and Hammarlund's new SP-400 Super Pro still used the prewar metal tubes.

The first postwar receiver to depart significantly from the 1933 RME-9 circuit was the Collins 75A in October 1946. This receiver introduced the multi-conversion, fixed HFO circuit which eventually became the basis for most quality receivers well into the 1980's, until the step-tuned, fully synthesized receiver took over. In the 75A the HFO was crystal controlled and the tuning done with a permeability tuned VFO. The result was a degree of frequency stability and readout accuracy never before approached.

The 75A was Collins' first venture into the general communications receiver market. The 75A evolved through the 75A-4 and then into the smaller 75S series which continued in production until the mid-1970's. The general coverage 51-J series evolved from the 75A, as did, eventually, the R-390 series, perhaps, the ultimate vacuum tube receiver.

Other receivers in the immediate postwar period retained prewar circuitry, until the 1950's. The Hallicrafters SX-42, National HRO-5, Hammarlund SP-400 and the RME-45 were only slightly changed from the 1930's models. Two new companies entered the communications receiver market. The Pierson KP-81 and the Cardwell 54 were conventional, straight superheterodynes, but neither lasted very long.

Hallicrafters maintained their prewar tradition of manufacturing a broad line of receivers for every purse. The S-38 replaced the low end S-19 Sky Buddy although inflation nudged the price up from the traditional $29.50 to $39.50. The S-38 eventually evolved into the S-38E which lasted until 1961 and sold for $54.95. The S-40 was a repackaged S-20 Sky Champion and lasted through a number of revisions until 1954.

Eventually, the first postwar decade did produce dramatic changes in communications receiver design and much of the credit for this must go to the ARRL's campaign for increased use of SSB by amateurs. They had been pushing better selectivity for some time to reduce heterodyne interference on the congested phone bands and in 1948 went all the way and advocated SSB, thus eliminating the source of the heterodynes.

Point-to-point communications companies had been using SSB for years but their cumbersome, complex, custom made equipment was not suitable for amateur use. So, the techniques, components and circuits had to be developed to make SSB practical for general use. The frequency stability of postwar receivers (except the 75A) were grossly inadequate. Much better selectivity was required for both sideband generation and reception. A different approach to AVC was needed.

Collins became heavily involved in SSB, not only for amateurs, but for commercial and military applications. They had already shown the way to adequate frequency stability with fixed HFO, tunable VFO approach of the 75A.

In 1952, Collins announced another revolutionary development, the mechanical filter. With its flat top and steep sides, in a compact package, the mechanical filter was the perfect component for SSB generation and reception. Until then most receivers used Lamb's 1932 series-resonant crystal with its peaked nose and drooping skirts.

Another method of obtaining a near-optimum selectivity curve is with cascaded L/C circuits at a low intermediate frequency. McLaughlin described 50 kHz IF amplifiers for single sideband reception of AM signals in *QST* in 1941 and 1947. In 1948 McMurdo Silver manufactured an IF amplifier with eight 100 kHz tuned circuits which had nearly ideal selectivity.

Hallicrafters was the first to integrate the low frequency, cascaded IF system into a receiver. In 1951 Hallicrafters introduced a 50 kHz IF system in the S-76 receiver, an arrangement they would continue to use in their top receivers for the next 15 years. It used a number of 50 kHz high-Q tuned circuits which had a very narrow, steep sided selectivity curve when they were all peaked on the same frequency. By switching in capacitors to detune the circuits, and resistors to spoil the Q, the passband was widened for phone reception.

The quest for selectivity regressed a bit with the popularization of the Q-multiplier in 1952. The circuit was originally described in *Electronics* and then was picked up and promoted by *CQ*. It was briefly popular because it was inexpensive and could be added outboard to existing receivers with inadequate selectivity. It shared the faults of very high Q, single circuits with the crystal filter - a sharp peak and poor skirts.

Another significant new feature of receivers during the 1946-55 decade was the use of multiple conversions to provide a high IF for superior image rejection and a low IF for selectivity. All the manufacturers, except Collins, retained the tuned HFO along with a crystal controlled second oscillator. Thus, by adding a converter to the signal path, they were able to achieve double conversion, yet retain basically, the familiar, comfortable straight superheterodyne.

The first Hallicrafters double conversion receiver was the SX-71 in 1950. This receiver also departed drastically from the traditional Hallicrafters appearance with its two slide-rule dials. The SX-71 had intermediate frequencies of 2075 and 455 kHz with the standard single crystal filter in the 455 kHz IF.

In the same year Hammarlund delivered their new SP-600 with IF's of 3955 and 455 kHz. And, in 1952 National joined the bandwagon with the HRO-60 (2010 and 456) kHz and the NC-183D (1720 and 455 kHz). All of these receivers also used Lamb's crystal filter in the second IF.

The Hammarlund SP-600 was perhaps the ultimate refinement of the straight superheterodyne with a tunable HFO. The "Series 600 Super-Pro" was announced with a full page display in the 1948 ARRL Handbook. It was finally delivered about 1950 with a considerably different appearance and tube lineup than shown in the Handbook advertisement. The set featured a rotating coil turret and one of the smoothest tuning mechanisms ever built.

The September, 1953, issue of *Radio & Television News* shows a picture of the 10,000th SP-600 coming off the production line. Since the SP-600 was being sold as late as 1972 it must have been one of the highest production receivers ever.

National continued to produce their classic HRO during the decade. The first postwar model, the HRO-5, was little changed from the original. It was replaced in 1947 with the HRO-7 with a streamlined cabinet but no basic changes in circuitry. In a drastically redesigned receiver, the HRO-50, in 1951, the power supply was brought into the cabinet, tubes changed to miniature types and a direct reading slide-rule dial added. The HRO-50-1 added an IF stage and cascaded the IF transformers in 1951. The final model, the HRO-60, was introduced in 1952 and remained in production until 1964. It retained the original plug-in coils and PW dial.

Seven page advertisements in the December, 1953, *CQ* and the January, 1954, *QST* heralded the most lavishly promoted receiver ever, the Hallicrafters SX-88. An impressive 20 tube receiver, it introduced a successful styling and electrical concept that Hallicrafters used for many years. Electrically the SX-88 was a two dial, double conversion receiver with a first IF of 2075 kHz and employing the 50 kHz second IF introduced in 1951 with the S-76. In spite of the massive advertising which accompanied its debut the SX-88 was not a success and it was last advertised in November, 1954, only eleven months after its introduction. However, the SX-88's basic design and styling lived on in the popular SX-100 and several other models.

Another beneficiary of a high-powered advertising campaign was National's "dream receiver," the NC-300. The unveiling of the receiver on September 30, 1955, was preceded by an eight month campaign of "dream receiver" design contests and by advertisements showing a receiver covered with a tarpaulin, ready for unveiling, like a new work of sculpture. The NC-300 covered only the amateur bands with a first IF of 2215 kHz and a second IF of 80 kHz, a high C HFO and large slide-rule dial.

## THE END IN SIGHT - 1956-65
## THE SECOND POSTWAR DECADE

All the major communications receiver manufacturers were deep in trouble during the second postwar decade, 1956-65. RME, after over ten years of struggling disappeared in 1962. The 1950's were troubled years for Hallicrafters. Bill Halligan sold the company, repurchased it, and finally sold out to Northup in the mid-1960's. Hammarlund hung on until 1967 when they were purchased by the first of a series of owners who used the Hammarlund name until it faded away in the 1970's. National struggled and declined during this same period. It survived under Chapter 11 as a small operation doing military replacement business until they finally folded permanently in the late 1980's.

Collins lasted longer than the others because they were leaders and correctly judged the future shape of communications equipment. Today, Collins is part of Rockwell International and still manufactures commercial and military communications receivers.

The heavy and cumbersome equipment of previous decades went out of style in the mid-1950's. Previously, weight and mass were de rigueur in a stable, quality receiver. A ham took pride in impressing visitors with a six foot rack of transmitting equipment and a table groaning under the load of a monster receiver.

Suddenly, desires changed. People wanted the new shoebox sized equipment. They wanted it to perform better, be more reliable and be more attractive by contemporary standards. Collins and Drake, a new company, guessed right and managed to prosper a little longer.

National and Hallicrafters were caught going the wrong way with bigger and heavier receivers. In 1955 National promoted the NC-300 as "Massive in the Modern Manner." In 1956 Hallicrafters advertisements said of the SX-101, which weighed 70 pounds and measured 20"X10½"X16","...built like a battleship. Bigger, Heavier." Unfortunately, the public wanted their receivers to be less massive, smaller and lighter.

So, in 1957, as the old-line manufacturers made bigger and heavier receivers, Collins introduced the KWM-1, a complete 175 watt SSB transmitter and receiver less power supply, in a package 6¼"X14"X10" and weighing 15 pounds! Byron Goodman reviewed the KWM-1 in *QST* in 1958 and said, "...the KWM-1 may well mark the end of one era and the beginning of another...it could well be a way of life."

A newcomer, R. L. Drake, produced the first small, modern communications receiver, also, in 1957. Their 1A was designed specifically for SSB and had many of the features of the Collins 75A at an economical price ($299 vs $645). The 1A had a fixed HFO and a VFO feeding the second mixer. It had a bandpass first IF (2.9-3.5 mHz) rather than the tunable first IF of the 75A. A third IF of 50 kHz provided selectivity. The 1A was the ancestor of a long line of Drake receivers culminating with the last receiver to use vacuum tubes, the R-4C, which sold until 1980.

Collins continued to push the new, small concept in 1958 when they replaced the 75A series with the 75S-1 receiver. They introduced their new "S" line of ham equipment in November, 1958, with four page, full color advertisements. The 75S-1 was not dramatically new electrically, most of its features having appeared previously in the KWM-1 and Drake 1A. But, its new long and low appearance can still be recognized in most receivers and transceivers to this day.

As Goodman foresaw, the trend to transceivers eventually almost eliminated the separate communications receiver. The trend started slowly with Collins alone for a number of years. One reason was that the "S" line successor to the KWM-1, the KWM-2, cost $1150. In 1961 Swan Engineering, another new company, eliminated the cost factor with a line of single band transceivers selling for $275. Within a few years a dozen companies offered transceivers.

While reeling from the change in public taste to compact, light equipment and the trend to transceivers, the communications receiver companies had another problem looming. The solid-state revolution was gaining on them and they didn't know what to do about it.

There was a popular notion that tubes were and always would be superior performers in the signal paths of receivers. This made it easier for manufacturers to rationalize that they could continue with the old, familiar ways.

But the military was already going full speed into solid state and, in 1956, Regency made news with the ATC-1 transistorized amateur band converter. In

January, 1962, Davco announced the DR-30 all solid-state receiver. This receiver, using the same conversion system as the 75S-1 and Drake 1A, was a comparative miniature at 7½"X5"X4" and weighing seven pounds. In December, 1962, Faust Gonsett announced the formation of Sideband Engineers and the availability of the SBE-33 transceiver which was completely solid-state except for the driver and final. It measured only 5½"X11½"X10½" and weighed 15 pounds including the power supply.

Perhaps the end for the vacuum tube communications receiver came in October, 1964. It was in that month, exactly 30 years after the introduction of the original HRO, that National announced the HRO-500. It was the first commercial solid-state, high performance, general coverage communications receiver. The HRO-500 immediately became the ultimate receiver. Unfortunately, it did not save National. Nor did the belated solid-state efforts of the other manufacturers save them. The Japanese were in the wings.

The vacuum tube communications receiver lasted less than 50 years. The last one to be manufactured was the Drake R-4C, which was discontinued in 1980. It was a hybrid receiver using six tubes along with 39 semiconductors.

## WEST COAST MANUFACTURING

As we have traced the evolution of the communications receiver and the industry it spawned, we have concentrated on the big companies in the East and Midwest. However, the West Coast had a dynamic group of companies which were at the forefront of communications receiver technology, but which have not received the recognition they deserve.

E M Sargent, an old shipboard operator, formed a group of companies in Oakland in the 1920's and one of his affilliates, Radio Constructors Co, perhaps made the first communications receiver. In 1930 they made the Long Range Deluxe and in 1931 the more advanced Amateur Special. In 1933 Sargent was the first to use dual conversion in the 9-33. They continued to make a popular line of communications receivers until 1940.

In 1933 Ray Gudie designed the PR-10 for Patterson Electric in Los Angeles. Patterson is said to have sold almost 50,000 PR-10's, many to Southeast Asia. If so, it was one of the most successful communications receivers ever. Gudie is believed to have asked to be rewarded for the success of the PR-10 and got into a dispute with Emmitt Patterson and quit in 1934 while the company was in the throes of developing their next model, the PR-12.

Gudie then went to work for Paul J Breting of Breting Radio where he designed a series of six communications receivers which were manufactured from 1935 to 1940. It is interesting that Gudie used a 432 kHz IF on the PR-10 and also on the Breting receivers. Why that frequency?

Meanwhile, Patterson hired Karl Pierson to help them with the PR-12 design which was eventually scrapped even after a June, 1935, ad in *QST* stating "Now in production." He went on to design the PR-16 in 1935 and the successful PR-15 in 1937. Pierson left Patterson that same year, puchased their communications equipment line including the PR-15, and started Pierson-DeLane, also in Los Angeles. Pierson-DeLane closed during the war and Pierson went to work for defense contractor Raytheon.

In 1946 Pierson started Pierson Electronics. Their one product was the KP-81, a top-of-the-line set which ranks with the best straight superhet vacuum tube sets. Less than 300 were sold and the company folded in 1948. Pierson's last venture was Pierson-Holt Electronics in Burbank which marketed an advanced mobile type receiver, the KE-93, advertised as the successor to the KP-81. The company was sold to Automation Electronics in 1957 where the KE-93 remained in production until 1960.

The next West Coast entrepreneur to make a contribution to communications receivers was Faust Gonsett, who founded

Gonset Electronics in Burbank in the early 1950's. They manufactured simple VHF transceivers and mobile receivers. The company became a division of Young Wire and Cable in the late '50's and from 1958 to 1962 produced a line of mid-range communications receivers.

Gonsett's most significant contribution to communications receivers came in late 1962 when he formed Sideband Engineers and announced the availability of the SB-33. It was a small, solid state transceiver which contained one of the first successful solid state receivers.

Swan Electronics was another of the West Coast's pacesetting companies. In 1961 Herb Johnson started the company in Benson, AZ, to manufacture a revolutionary SSB transceiver selling for $275 at a time when the Collins KWM-1 cost $1175. A year later Swan moved to Oceanside, CA, the first of a number of electronic companies to move to that seaside town. Swan merged with Cubic Communications in 1969 and in 1971 introduced one of the last new vacuum tube receiver designs, the hybrid 600-R with 7 tubes, 8 transistors and 12 semi-conductor diodes.

True to West Coast tradition Herb Johnson appeared again in 1974 as founder of Atlas Electronics which made an advanced solid state transceiver. But Johnson was not through. After being dormant for many years he announced in 1992 the reactivation of Atlas with a new transceiver so his story is not yet over.

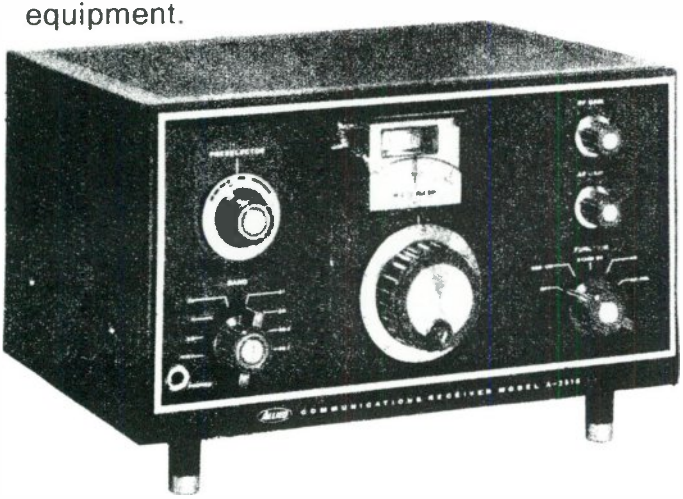
Gilfillan Brothers of Los Angeles, although they produced no receivers under their name, was an important factor in the 1930's communication industry in the Los Angeles area. They had the exclusive RCA manufacturing license for the western states and assembled receivers for Breting, Patterson and Pierson DeLane.

We are indebted for much of the information on West Coast radio to Floyd Paul, a radio historian, who specializes in Los Angeles area radio manufacturers. His numerous articles in *SCARS Gazette* and his book *Los Angeles Radio Manufacturing* helped in compiling the story of the West Coast communications receiver industry.

# SECTION II THE TABLES

## ALLIED (KNIGHT)

Allied was a large mail order distributor located in Chicago which was a favorite of amateurs and radio hobbyists from the 1930's into the 1960's because of its large catalog sent out free of charge. They were acquired by Radio Shack (Tandy) in 1970 and eventually wound up as part of another distributor, Hall-Mark electronics. They still issue a large catalog today but it is aimed at industrial users. Until the 1960's Allied produced the Knight or Knight-Kit line of equipment including receivers and test equipment.

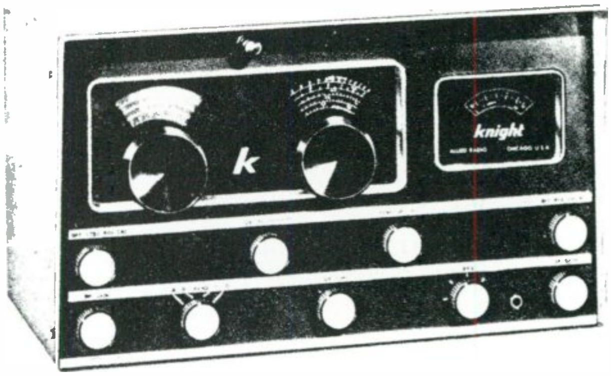


**MODEL:** A2516 **YRS:** 1970 **PRICE:** $170 **BANDS:** 8 600 kHz bands 80-10 mtrs + WWV **TYPE:** Dual conversion, fixed HFO **IF:** 8900-9500, 455 kHz **FILTER:** Xtal lattice **TUBES:** 7 + 6 diodes + 2 transistors, 6BZ6 rf, 6BL8 mix1/xco, 6BE6 mix2, 2SC185 vfo, 2SC185 vfo buff, 2 6BA6 if, 6AQ8 prod det/bfo, 6BM8 af1/af out, 1N60 det, CR1, CR4 agc, CR3 anl, CR5 vr, CR6 rect **ANT IN:** 2 Screw term **AF OUT:** 1 W, 8/500Ω **REMARKS:** Made in Japan, same as Kenwood JR-500.

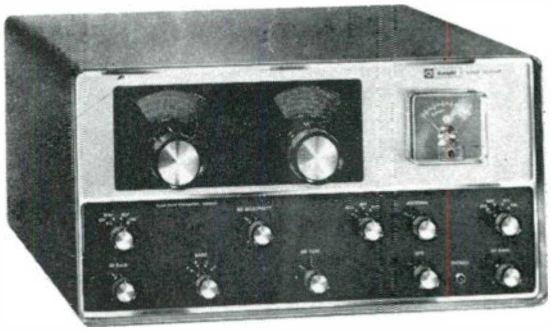
## ALLIED (KNIGHT)

**MODEL:** R-55 **YRS:** 1960-61 **PRICE:** $67.50 **BANDS:** 5, .53-36, 47-56 mHz **IF:** 1650 kHz **FILTER:** None **TUBES:** 6, 6BE6 conv, 6DK6 (6BZ6) if1, 6AW8 if2/af1, 6AL5 det/nl, 6AW8 af out/bfo, EZ90(6X4) rect **ANT IN:** Screw term, 50 Ω **REMARKS:** Internal speaker, kit.

**MODEL:** R-55A **YRS:** 1967-68 **REMARKS:** Appears same as R-55 except panel colors reversed.



**MODEL:** R-100 **YRS:** 1959-61 **PRICE:** $104.50 **BANDS:** 4, .54-30 mHz **IF:** 455 kHz **FILTER:** Q mult **TUBES:** 9, 6BZ6 rf, 6BH6 mix/hfo, 6AZ8 if1, 6AZ8 if2/af1, ECC83(12AX7) q mult, 6BC7 avc/det/anl, 6AW8 af out/bfo, 0B2 vr, 6X4 rect **ANT IN:** 2 screw term, SO239, 50-300 Ω unbal **AF OUT:** 0.5 W, 8Ω **REMARKS:** Kit, stock no Y-726.



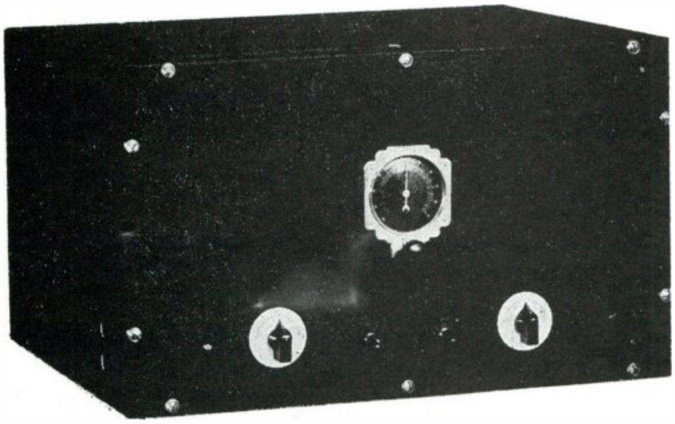
**MODEL:** R-100A **YRS:** 1962-63 **PRICE:** $99.95 **BANDS:** 4, .54-30 mHz **IF:** 455 kHz **FILTER:** Q mult **TUBES:** 9, 6BZ6 rf, 6BH6 mix/hfo, 6AZ8 if1, 6AZ8 if2/af1, 6BC7 det/avc/nl, 12AX7 q mult, 6AW8 af

## ALLIED (KNIGHT)

out/bfo, 0B2 vr, 6X4 rect **ANT IN:** 2 screw term, SO-239, 50-300 Ω unbal **AF OUT:** 8 Ω, 0.5 W **REMARKS:** Kit, optional "S" meter and calibrator. Adds antenna trimmer to panel.

## BARRETT

The Barrett Mfg Co, 1382 16th Ave, San Francisco, CA, briefly promoted a communications receiver in 1934.



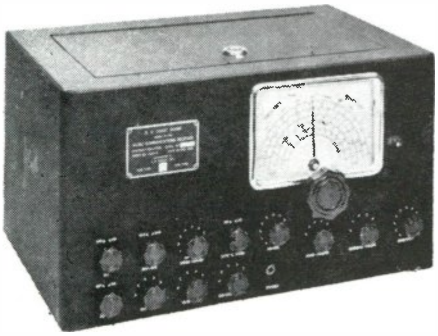
Courtesy Doug Lyon

**MODEL:** DX-8 **YRS:** 1933-34 **PRICE:** $72.50 **BANDS:** 5, 1.5-30 mHz **IF:** 525 kHz **FILTER:** Xtal **TUBES:** 8, 58 rf, 2A7 conv, 2 58 if, 2B7 det/avc/af1, 24 bfo, 2A5 af out, rect **REMARKS:** Plug-in coils.

**MODEL:** DX-8 (Variation) **REMARKS:** Earlier model had a larger, semicircular dial.

## BOULEVARD ELECTRONICS

Boulevard Electronics, Inc, 808-10 W. Jackson Blvd, Chicago, a distributor, advertised a communications receiver kit in 1953.

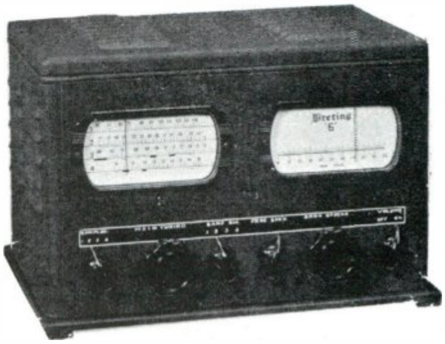


## BOULEVARD ELECTRONICS

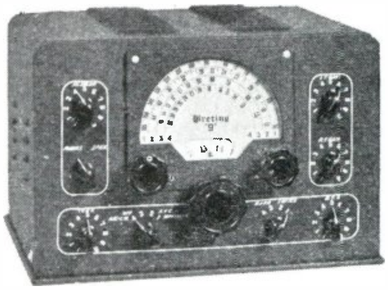
**MODEL:** None **YRS:** 1953 **PRICE:** $69.50 **BANDS:** 6, 0.2-0.4, .49-19 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 11 + sel rect, 6SG7 rf, 6SB7 conv, 2 6SG7 if, 6H6 det/nl, 6SF7 avc amp, 6SL7 bfo/af1, 6SL7 ph inv, 2 25L6 p/p af out, VR75 vr, sel rect **ANT IN:** 3 term **REMARKS:** Kit, 105-125 V., AC/DC. Assembled from surplus parts from a US Coast Guard contract.

## BRETING

The Breting Radio Manufacturing Co, 1815 Venice Blvd, Los Angeles, produced communications receivers from 1934-40. Paul J Breting started the company in 1934 and last advertised in April 1940. Ray Gudie, who had previously designed the PR-10 for Patterson (q.v.), was their chief engineer. Gudie left the company in late 1930 and turned up in 1939 as head of the communications receiver repair dept for Radio Supply. Note the unusual intermediate frequency of 432 kHz used by Gudie in the Breting receivers and also in the PR-10. The listed address was that of Gilfillan Bros (q.v.)

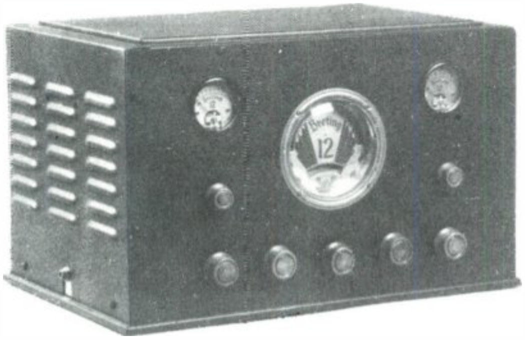


**MODEL:** 6 **YRS:** 1939-40 **PRICE:** $32.40 **BANDS:** 4, .55-30 mHz **FILTER:** None **TUBES:** 6 **REMARKS:** Internal speaker.

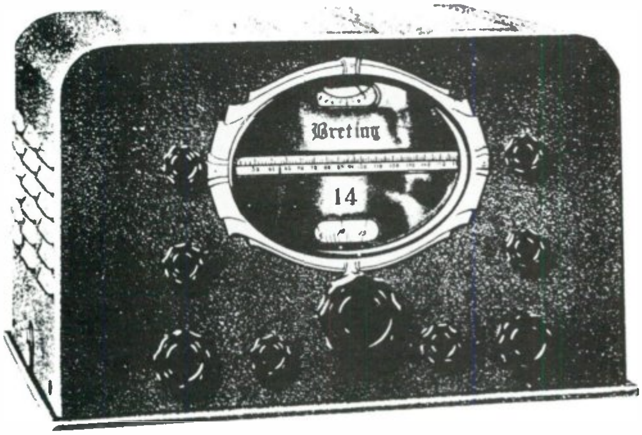


## BRETING

**MODEL:** 9 **YEARS:** 1938-40 **PRICE:** $54 **BANDS:** 4, .54-34 mHz **IF:** 432 kHz **FILTER:** Regen if **TUBES:** 9, 6K7 rf, 6J7 hfo, 6L7 mix, 6K7 if, 6C5 bfo, 6Q7 det/avc, 6K7 noise sil, 6F6 af out, 80 rect **ANT IN:** 3 term screw **AF OUT:** 3 W



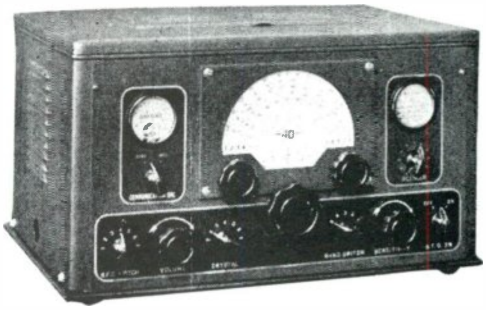
**MODEL:** 12 **YRS:** 1935-36 **PRICE:** $93 **BANDS:** 5, .55-30 mHz **FILTER:** Crystal **TUBES:** 12, 6B7 rf1/mtr amp, 6D6 rf2, 6C6 mix, 6D6 hfo, 2 6D6 if, 6V7 det/avc/af1, 6D6 bfo, 42 af2, 2 42 p/p af out, 5Z3 rect **ANT IN:** 3 term **AF OUT:** 2Ω spkr, 500Ω mod **REMARKS:** Dual mtrs read % modulation and field strength. Has output terminals to modulate a transmitter.



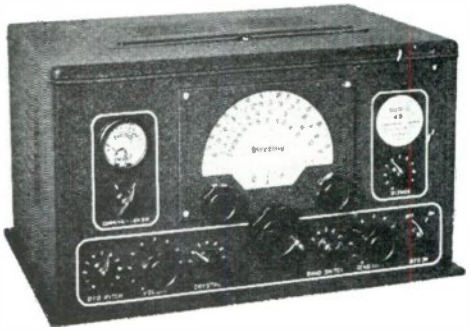
**MODEL:** 14 **YRS:** 1936 **PRICE:** $99 **BANDS:** 5, .55-34 **IF:** 432 kHz **FILTER:** Crystal **TUBES:** 14, 2 6K7 rf, 6J7 hfo, 6J7 mix, 6K7 if1, 6L7 if2, 6B8 det/avc/af1, 6J7 bfo, 6F6 af2, 2 6F6 p/p af out, 6K7 noise sil amp, 6H6 noise rect, 5Z3 rect **ANT IN:** 2 screw term **AF OUT:** 18 W, 2Ω spkr, 200Ω mod **REMARKS:** Has output terminals to modulate a transmitter.

## BRETING

**MODEL:** 14AX **YRS:** 1938 **PRICE:** $99



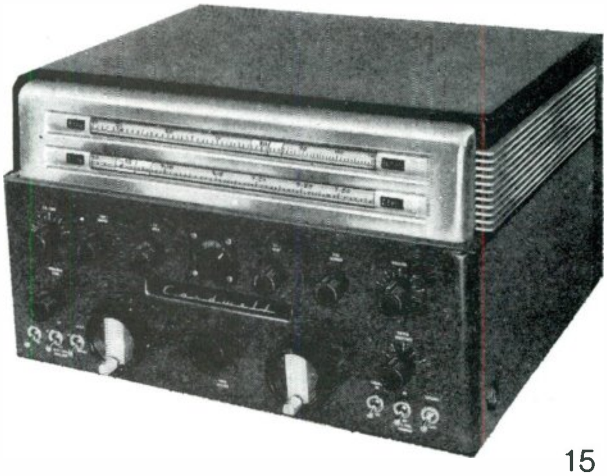
**MODEL:** 40 **YRS:** 1939-40 **PRICE:** $99 **BANDS:** 5, .55-34 mHz **FILTER:** Crystal **TUBES:** 14 **AF OUT:** 18 W, 2Ω spkr, 8Ω aux, 200Ω mod **REMARKS:** Has output terminals to modulate a transmitter.



**MODEL:** 49 **YRS:** 1938-39 **PRICE:** $99 **BANDS:** 4, .55-34 mHz **IF:** 1560 kHz **TUBES:** 13, including 1852 rf

## CARDWELL

The Allen D Cardwell Manufacturing Co, Plainville, CT, was a major component manufacturer, particularly noted for capacitors. After the war they briefly advertised a communications receiver.



## CARDWELL

**MODEL:** CR-54 **YRS:** 1946-47 **BANDS:** 6, .54-40 mHz **FILTER:** Crystal **TUBES:** 18 **AF OUT:** 8 W, p/p Cl AB, 4 out Zs **REMARKS:** Turret band switching, optional coverage to 54 mHz.

## CENTRAL ELECTRONICS

Central Electronics, one of the very early manufacturers of SSB transmitting equipment, was founded in 1950 by Wes Schum, W9DYV, in the basement of his home, 2125 W. Giddings St, Chicago, IL. As the business grew they moved to 1247 W Belmont Ave, Chicago. Central Electronics became a wholly owned subsidiary of Zenith in 1959. Wes Schum continued on as VP. Zenith shut down CE in 1962. In mid-1959 they announced, "coming up! A new companion receiver which will transceive with the 100V transmitter." As far as we know, this receiver never reached production.

## COLLINS

Arthur A Collins, W9CXX, started manufacturing amateur transmitters in the basement of his house at 1620 6th Ave SE, Cedar Rapids, IA, in 1931. His first advertisement in *QST* appeared under his own name in January 1932. In March, 1932, the name was Collins Radio Transmitters and the message was, "Units from $33.95 up with carrier powers of 30 to 300 watts". In December, 1932, the name was changed to its final form, Collins Radio Company. In 1933 the company incorporated and moved to 2920 First Avenue in downtown Cedar Rapids.

By 1933 the firm had eight employees. When Bob Samuelson joined them in 1934 employment was up to sixteen. In 1940 employment had grown to 150 and in 1945 reached its wartime peak of 3332.

The quality of design and construction of Collins equipment soon attracted the attention of broadcasters and the company became a major supplier to the burgeoning Short Wave broadcast market as well as to domestic broadcasters. Police and airline markets were next and by the end of the decade Collins was a major supplier to the commercial airlines.

During World War II the company produced transmitters for the armed services. Collins turned out 26,000 of the 100 watt AN/ART-13 airborne transmitters during the war and other companies produced another 90,000 of the Collins designed equipment. They also manufactured 35,000 of the TCS vehicular transmitter-receiver.

The percentage of Collins' business derived from amateur equipment declined almost from the start and by the post-war years the amateur market was only a minor part of their business. However, they were best known to the public for their quality amateur transmitters and receivers and the amateur division remained important to the company for public relations purposes.

After Japan's surrender in August, 1945, over two thirds of Collins' military contracts were cancelled. They immediately put their resources into developing new products for the post-war market. The first new amateur products were announced in 1946. Their revolutionary permeability tuned oscillator, designed by Ted Hunter, WØNTI and which established new standards for frequency stability and readout accuracy, was used in the 75A receiver. The 75A also pioneered the concept of using a crystal controlled first oscillator with a variable frequency second oscillator.

The 75A was a ham band only receiver and was followed by the 75A-1 (1947), 75A-2 (1950), 75A3 ((1952) and 75A4 (1955). The 75A4, one of the first receivers designed specifically for SSB, is an all-time classic amateur receiver.

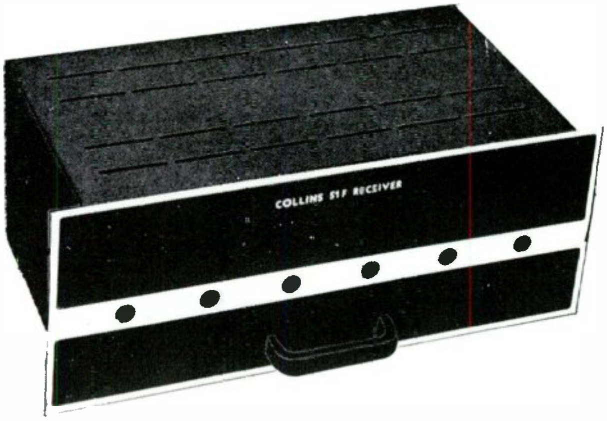
The 51J series of general coverage receivers also developed from the 75A and was similar to it electrically and mechanically. The series included the 51J-1 (1949), 51J-2, 51J-3 and and 51J-4 (1955) as well as the military R-381 and R-388. The design finally evolved into the mechanically marvelous military receivers, the R-390 and R-390A. These massive, digital readout sets were perhaps the ultimate vacuum tube receivers.

However another Collins development ironically spelled the demise of the stand-alone communications receiver. In 1957 they introduced the KWM-1, a complete 175 watt SSB transmitter and receiver, less power supply, in a 15 pound package. Byron Goodman in *QST* prophetically noted ". . . the KWM-1 may well mark the end of one era and the beginning of another. . .it could well be a way of life."

In 1958 Collins replaced the 75A series with the smaller and lighter "S" line. The amateur band receivers were the 75S-1 (1958), 75S-2, 75S-3 (1961) and the 75S-3B which retained the basic 75A conversion scheme. The general coverage "S" line receiver was the 51S-1 which was manufactured from 1959 to 1975.

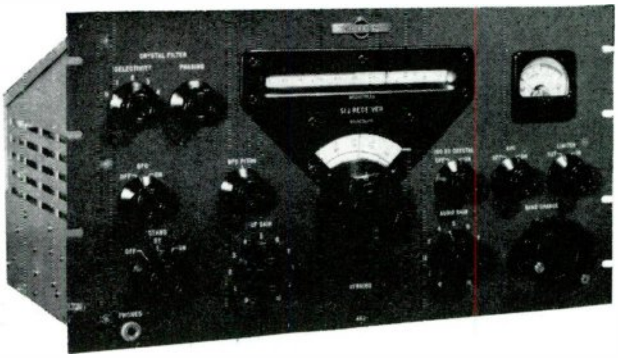
By the late 1960's Collins had grown to a $500 million company, but like many defense contractors, was having financial problems. Collins Radio was acquired by Rockwell International in 1971. Arthur Collins stayed on briefly after the merger but resigned in 1972 and formed a consulting firm in Dallas. He died in 1987.

**MODEL:** 51F **YRS:** 1939-40 **BANDS:** 1 fixed frequency between 1.5-20 mHz **IF:** 456 kHz **TUBES:** 11 **AF OUT:** 0.5 W, 500 and 8 Ω **REMARKS:** Fixed frequency receiver, diversity terminals.



**MODEL:** 51F (Variation) **YRS:** 1939 **REMARKS:** Probably a prototype.

**MODEL:** 51-H **YRS:** 1945-52 **REMARKS:** R-105/ARR-15 (q.v.).



**MODEL:** 51J-1 **YRS:** 1949-50 **PRICE:** $875 ($975) **BANDS:** 30, 0.5-30.5 mHz **TYPE:** Dual conv, fixed hfo **FILTER:** Crystal **TUBES:** 16, 6AK5 rf, 6BE6 mix 1, 6BA6 xco, 6BE6 band 1 mix, 6BA6 xco, 6BE6 mix 2, 6BA6 vfo, 2 6BA6 if, 12AX7 avc/det, 12AX7 if k fol/avc amp, 6SJ7 bfo, 12AX7 nl/af1, 6AQ5 af out, 6BA6 calib, 5V4 rect **ANT IN:** 3 screw term, 300 Ω **AF OUT:** 1.5 W, 4/600 Ω

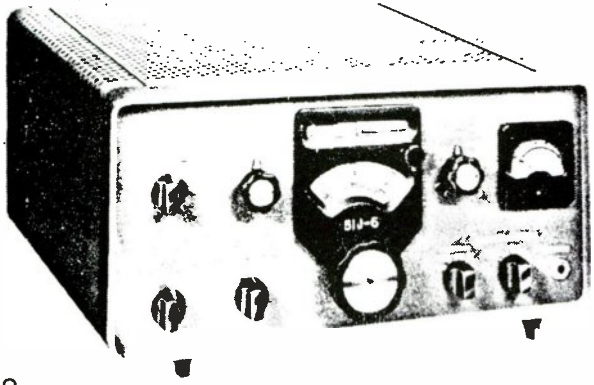
**MODEL:** 51J-2 **YRS:** 1950 **REMARKS:** Same as 51J-1 except has meter switch to left of meter and wording on crystal calib switch changed to "Calibrate."

## COLLINS

**MODEL:** 51J-3 **YRS:** 1952-55 **PRICE:** $1000 **BANDS:** 30, 0.5-30 mHz **TYPE:** Dual conv, fixed hfo **IF:** 2500-1500(2500-3500), 500 kHz **FILTER:** Crystal **TUBES:** 18 + diode, 6AK5 rf, 6BE6 mix1, 6AK5 xco, 6BE6 band 1 mix, 6BE6 mix 2, 6BA6 vfo, 6BA6 buff, 3 6BA6 if, 12AX7 det/avc rect, 6BA6 bfo, 12AU7 if k fol/avc amp, 12AX7 nl/af1, 6AQ5 af out, 6BA6 calib, 0A2 vr, 5V4 rect, meter rect **ANT IN:** SO239, 50 Ω **AF OUT:** 2.5 W, 4/600Ω **REMARKS:** uses 70E-15 vfo. Military R-388.

**MODEL:** 51J-4 **YRS:** 1955-63 **PRICE:** $1099 (1464) **BANDS:** 30, .54-30.5 mHz **YRS:** 1955-63 **TYPE:** Dual conv, fixed hfo **IF:** 3.5-2.5 (2.5-1.5) mHz, 500 kHz **FILTER:** Crystal & mechanical **TUBES:** 19 + diode, 6AK5 rf, 6BE6 mix1, 6BA6 xco, 6BE6 band 1 mix, 6BE6 mix 2, 6BA6 vfo, 6BA6 vfo buff, 4 6BA6 if, 12AU7 if k fol/avc amp, 6BA6 bfo, 12AX7 avc rect/det, 12AX7 nl/af1, 6AQ5 af out, 6BA6 calib, 0A2 vr, 5V4 rect, CR101 meter rect **ANT IN:** SO239, 50 Ω **AF OUT:** 2.5 W, 4/600 Ω **REMARKS:** US Navy designation R-388A.

**MODEL:** 51J-5 Prototype **REMARKS:** Prototype model, only one made.



## COLLINS

**MODEL:** 51J-6 **YRS:** 1957 **BANDS:** 31, 0.2-31 mHz **TYPE:** dual conv, fixed hfo **REMARKS:** Shown in 1958 Collins catalog. Looks like prototype of 51S-1. Probably never manufactured. Q multiplier and product detector.

**MODEL:** 51-Q **REMARKS:** US Navy COL-46159 (q.v.)

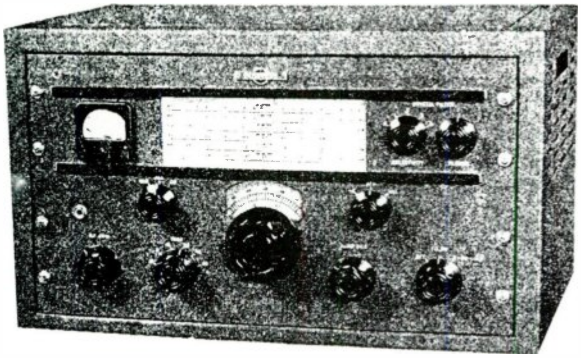
**MODEL:** 51S-1 **YRS:** 1959-1975 **PRICE:** $1828 ($2565) **BANDS:** 30, 0.2-30 mHz **TYPE:** Dual conv (7.0-30 mHz), triple conv (0.2-7.0 mHz), fixed hfo **IF:** 28-30 mHz (0.2-2.0 mHz only), 14.5-15.5 mHz (2-7 mHz only), 3000-2000, 500 kHz **FILTER:** Mechanical **TUBES:** 17 + 1 trans + 17 diodes, 6DC6 rf, 6U8A mix1/xco, 6U8A mix2/xco, 6U8A mix3/rem cont gate, 6136 vfo, 3 6BA6 if, 12AX7 q mult, 6BA6 agc amp, 5670 if k fol/agc k fol, 12AX7 line af1/local af1, 6BF5 local af2, 6AK6 line af2, 6BA6 bfo, 6U8A If mix/xtal calib, 6U8A If mix/xco, 4 1N28 prod det, CR5 mtr rect, 8 1N1695 rect, 1N482A agc rect, 1N128 am det, 1N482A agc stab, 1N67A muting trans supr, 2N647 ssb/cw af amp **ANT IN:** RCA jack, 52 Ω **AF OUT:** 1W, 4/600 Ω **REMARKS:** 8500 built. Reception on 0.2-2.0 mHz bands only suitable for lab applications and BC monitoring due to spurs and low sensitivity.

**MODEL:** 51S-1 (Variations) **REMARKS:** Changes in some production runs: 6EA8 replaced 6U8A, 7543 replaced 6136 vfo, 7543 replaced 6BA6 bfo, 2N388 or 2N2222A replaced 2N647 ssb/cw amp, added 2 zener diodes to vfo, added 4 diodes for meter bridge rect.

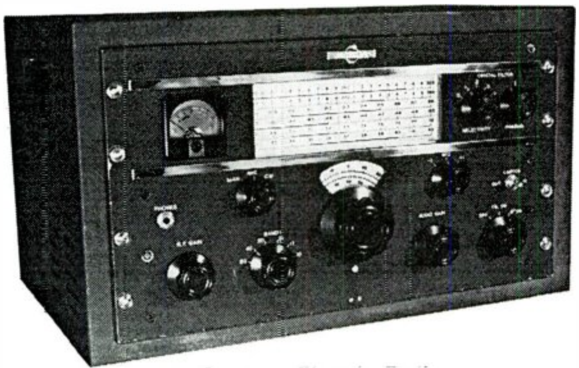
**MODEL:** 51S-1A **TUBES:** 17 + 5 trans + 15 diodes, same as 51S-1 except 3 1N1492 DC power supply rectifiers, 4 2N637B DC power supply switching transistors which replace 8 1N1696 **REMARKS:** 51S-1 with 28 VDC power supply.

**MODEL:** 51S-1AF **REMARKS:** Rack mounted 51S-1A.

**MODEL:** 51S-1B **REMARKS:** 51S-1 with rear mounted junction box with military type connectors for power, control, audio and antenna lines.

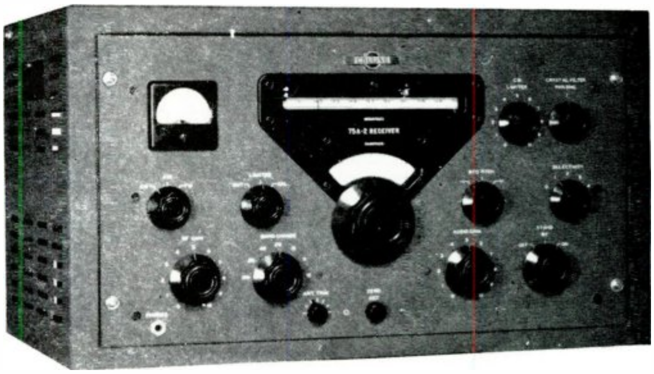


**MODEL:** 75A **YRS:** 1946-47 **BANDS:** 6, 80-10 mtrs **TYPE:** Dual conv, fixed hfo **FILTER:** Xtal **TUBES:** 14 **ANT IN:** 3 screw terminal, 300 Ω **AF OUT:** 2.5 W, 4/500 Ω **REMARKS:** Early 75A-1.



Courtesy *Electric Radio*

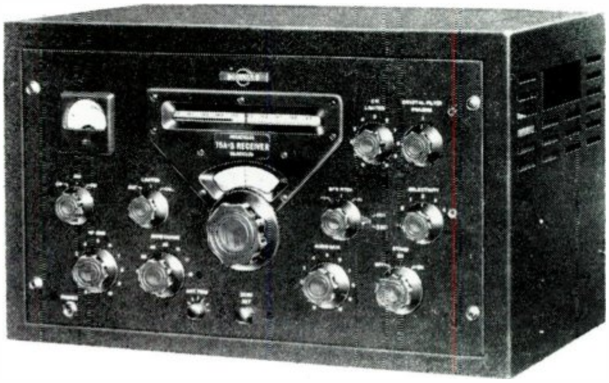
**MODEL:** 75A-1 **YRS:** 1947-50 **PRICE:** $375 **BANDS:** 6 ham bands, 80-10 mtrs **TYPE:** Dual conv, fixed hfo **IF:** 1500-2500 (3500-5500), 500 kHz **FILTER:** Xtal **TUBES:** 14, 6AK5 rf, 6SA7 mix1, 6AK5 xco, 6SK7 if1, 6L7 mix2, 6SJ7 vfo, 2 6SG7 if, 6SJ7 agc, 6H6 det/nl, 6SJ7 bfo, 6SJ7 af1, 6V6 af out, 5Y3 rect **ANT IN:** 3 screw terminal, 300 Ω **AF OUT:** 2.5 W, 4/500 Ω **REMARKS:** Uses 70E-7 pto. Differs from 75A in limiter switch on right side above function knob.



**MODEL:** 75A-2 **YRS:** 1950-52 **PRICE:** $420 **BANDS:** 7 ham bands, 160-10 mtrs **TYPE:** Dual conv, fixed hfo **IF:** 2500-1500 (5455-3455), 455 kHz **FILTER:** Xtal **TUBES:** 16, 6AK5 rf, 6BE6 mix1, 12AT7 xco, 6BE6 mix2, 6BA6 vfo, 6BA6 vfo buff, 3 6BA6 if, 6AL5 avc/det, 6BA6 bfo, 6AL5 nl, 12AX7 avc amp/af1, 6AL5 cw nl, 6AQ5 af out, 5Y3 rect **ANT IN:** 3 screw terminal, hole for SO-239, 50-150 Ω **AF OUT:** 2.5 W, 4/500 Ω **REMARKS:** Uses 70E-12 pto.

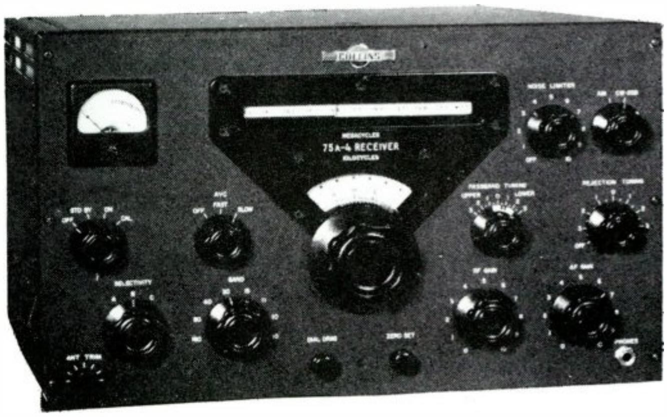
**MODEL:** 75A-2 (Variation) **TUBES:** 17, adds 0A2 vr to original 75A-2 complement.

**MODEL:** 75A-2A **YRS:** 1953 **FILTER:** Xtal & mech **REMARKS:** 75A-2 converted to 75A-3 by addition of mechanical filter.

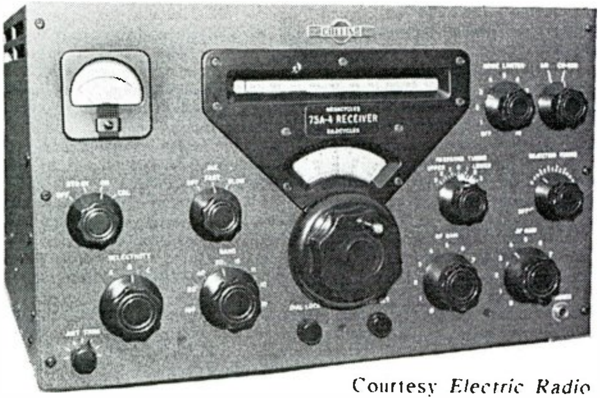


## COLLINS

**MODEL:** 75A-3 **YRS:** 1953-54 **PRICE:** $530 **BANDS:** 7 ham bands, 160-10 mtrs **TYPE:** Dual conv, fixed hfo **IF:** 2500-1500 (5455-3455), 455 kHz **FILTER:** Xtal & mech**TUBES:** 18, 6CB6 rf, 6BA7 mix1, 12AT7 xco, 6BA7 mix2, 6BA6 vfo, 6BA6 vfo buff, 4 6BA6 if, 6AL5 det/avc rect 12AX7 avc amp/af1, 6AL5 anl, 6BA6 bfo, 6AL5 cw nl, 6AQ5 af out, 0A2 vr, 5Y3 rect **ANT IN:** 3 screw terminal, SO-239, 50-150 Ω **AF OUT:** 2 W, 5/500 Ω **REMARKS:** Uses 70E-12 pto.



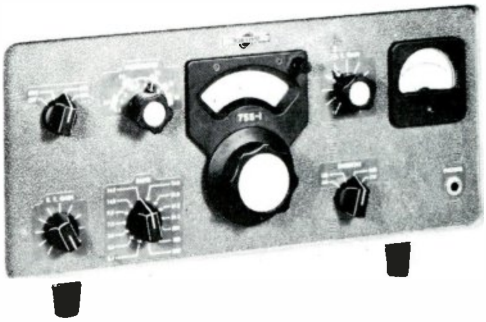
**MODEL:** 75A-4 **YRS:** 1955-58 **PRICE:** $645 **BANDS:** 7 1 mHz ham bands, 160-10 mtrs **TYPE:** Dual conv, fixed hfo **IF:** 1500-2500, 455 kHz **FILTER:** Mech **TUBES:** 22, 6DC6 rf, 6BA7 mix1, 12AT7 xco, 6BA7 mix2, 6BA6 vfo, 6BA6 vfo buff, 6BA6 if, 12AT7 q mult, 6BA6 if2, 6BA6 if3, 6AL5 det, 12AU7 prod det, 6BA6 bfo, 6BA6 avc amp, 6AL5 avc/noise clip, 6AL5 gain gate/bias rect, 12AT7 af1, 6AQ5 af out, 6AL5 nl, 6BA6 calib, 0A2 vr, 5Y3 rect **ANT IN:** 3 screw terminal & SO-239, 50-150 Ω **AF OUT:** 0.75 W, 4/500 Ω **REMARKS:** Uses 70E-24 pto.



Courtesy *Electric Radio*

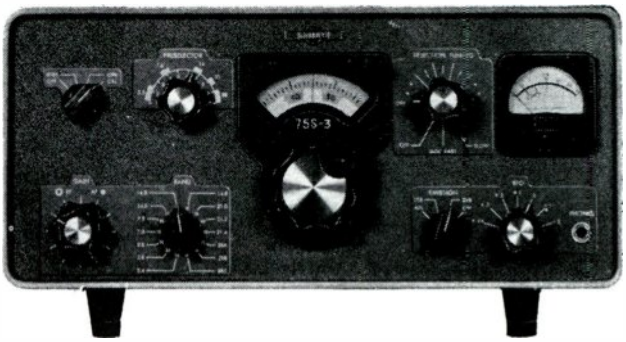
## COLLINS

**MODEL:** 75A4 (Variation) **YRS:** 1957-58 **REMARKS:** Latest production version of 75A-4, "prized by 75A-4 connoisseurs." Has vernier tuning knob and is identified by labelling for NOISE LIMITER and AM CW/SSB on the same horizontal line in the upper right corner.



**MODEL:** 75S-1 **YRS:** 1958-61 **PRICE:** $495 **BANDS:** 14 200 kHz bands, 3.4-30 mHz **TYPE:** Dual conv, fixed hfo. **IF:** 2955-3155, 455 kHz **FILTER:** Mech **TUBES:** 10 + 4 semi diodes, 6DC6 rf, 6U8A mix1/xco, 6U8A mix2/k fol, 6AU6 vfo, 2 6BA6 if, 6AT6 avc/det/af1, 6U8A prod det/bfo, 6BF5 af out, 6DC6 xtal calib, 1N34 freq shift sw, 2 1N1084 rect, sel rect bias rect, **ANT IN:** RCA jack, 50 Ω **AF OUT:** 1.8 W, 4/500 Ω **REMARKS:** Used 70K-2 pto. Uses <150 V. B+ to reduce heat and increase reliability.

**MODEL:** 75S-2 **PRICE:** $600 **BANDS:** 28 200 kHz bands, 3.4-30 mHz **REMARKS:** 75S-1 with 14 additional 200 kHz bands.



**MODEL:** 75S-3 **YRS:** 1961-63 **PRICE:** $620 **BANDS:** 14 200 kHz bands, 3.4-30 mHz **TYPE:** Dual conv, fixed hfo **IF:** 2955-3155, 455 kHz **FILTER:** Mech

## COLLINS

**TUBES:** 12 + 6 semi diodes, 6DC6 rf, 6U8A mix1/xco, 6U8A mix2/k fol, 6AU6 vfo, 12AX7 q mult, 2 6BA6 if, 6U8A prod det/bfo, 6AT6 det/avc/af1, 6DC6 var bfo, 6DC6 xtal cal, 6BF5 af out, 2 1N1084 rect, sel rect bias rect, HC7004 bfo tune, 1N732 vr, 1N34A freq shift sw **ANT IN:** RCA jack, 50 Ω **AF OUT:** 1.8 W, 4/500 Ω **REMARKS:** Uses 70K-2 pto. Uses <150 V. B+ to reduce heat and increase reliability. Changes from 75S-1: adds reject tuning, variable or xtal bfo, concentric rf/af gain, agc selector.

**MODEL:** 75S-3 (Variation) **REMARKS:** Replaces 2 1N1084 and sel rect with 3 1N1490.

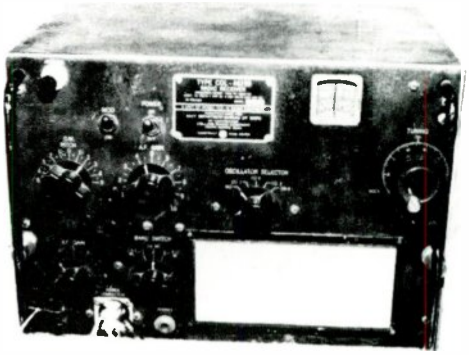
**MODEL:** 75S-3A **PRICE:** $750 **BANDS:** 28 200 kHz bands, 3.4-30 mHz **REMARKS:** 75S-3 with 14 additional 200 kHz bands.

**MODEL:** 75S-3B **YRS:** 1964-76 **PRICE:** $620 **BANDS:** 14 200 kHz bands, 3.4-30 mHz **TYPE:** Dual conv, fixed hfo **IF:** 2955-3155, 455 kHz **FILTER:** Mech **TUBES:** 12 + 7 semi diodes, 6DC6 rf, 6EA8 mix1/xco, 6EA8 mix2/k fol, 6AU6 vfo, 12AX7 q mult, 2 6BA6 if, 6AT6 det/avc/af1, 6EA8 prod det/xtal bfo, 6DC6 var bfo, 6DC6 xtal cal, 6BF5 af out, 3 1N1492 (or 1N1096) rect, HC7004 bfo tune, 1N732 vr, 1N3010A vr, 1N34A freq shift sw **ANT IN:** RCA jack **AF OUT:** 3 W, 4/500 Ω **REMARKS:** Uses 70K-2 pto. Changes from previous model: furnished with one if filter (SSB) plus 2 positions for optional cw filters, new 3 W. af output, oscillator zener regulated, am filter socket. Uses <150 V. B+ to reduce heat and increase reliability.

**MODEL:** 75S-3B (Variation) **REMARKS:** Later versions have 7543 vfo, replacing 6AU6.

## COLLINS

**MODEL:** 75S-3C **PRICE:** $850 ($2504) **BANDS:** 28 200 kHz bands, 3.4-30 mHz **REMARKS:** 75S-3B with 14 additional 200 kHz bands. Note price tripled to $2504 by 1977.



Courtesy Antique Wireless Association

**MODEL:** COL-46159 **YRS:** 1940-44 **BANDS:** 3, 1.5-12 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 7, 12SK7 rf, 12SA7 mix, 12A6 hfo, 2 12SK7 if, 12SQ7 det/af1/bfo, 12A6 af out **ANT IN:** MIL unbal, hi Z **REMARKS:** Part of TCS set built for US Navy. Also designated 51-Q (q.v.)

Courtesy *Electric Radio*

## COLLINS

**MODEL:** R-105/ARR-15 **YRS:** 1944-50 **PRICE:** $1500 **BANDS:** 6, 1.5-18.1 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 14, 12SG7 rf, 12SG7 mix, 12SJ7 hfo (pto), 12SG7 hfo buff/mult, 2 12SG7 if, 12SL7 nl, 12H6 nl, 12SL7 avc, 12SJ7 af1, 12A6 af out, 12SJ7 bfo (pto), 2 12SJ7 xtal cal **REMARKS:** Uses 70E-2 pto - first use of pto in a receiver? Uses freq mult so the fixed range (2-3 mHz) pto can cover the 1.5-18 mHz range with single conversion. The pto alternates between above and below the operating frequency. US Navy airborne receiver designed as companion to ART-13. Uses the Collins Autotune system. Total production estimated at 10,000. Also made by Bendix and others. 28 VDC dynamotor power supply. Also designated 51-H.

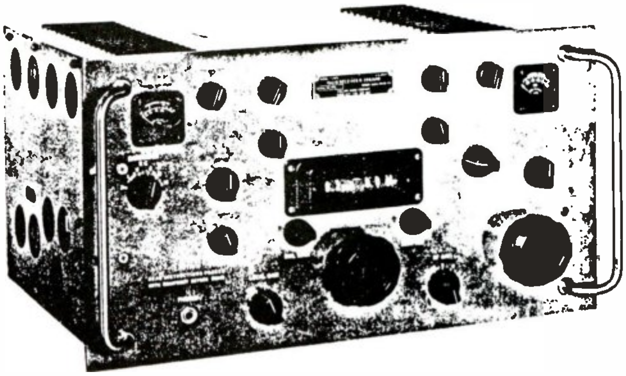
**MODEL:** R-105A/ARR-15 **YRS:** 1950-55 **REMARKS:** Minor circuit changes.

**MODEL:** R-381/URR-23 **REMARKS:** Military 51J-2

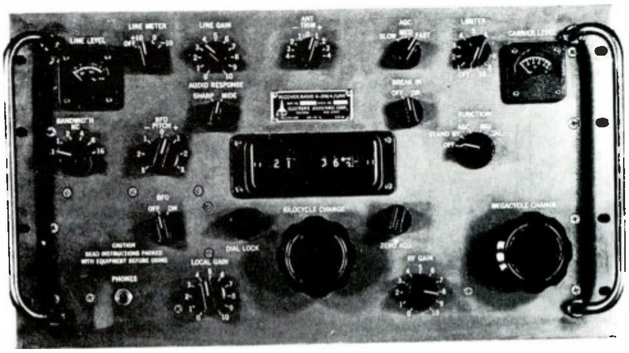
**MODEL:** R-388 **REMARKS:** Military 51J-3.

**MODEL:** R-388A **REMARKS:** R-388 with mechanical filters and nonmagnetic side panels for US Navy.

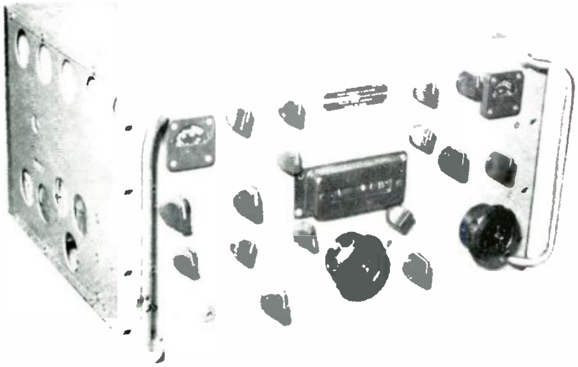
## COLLINS



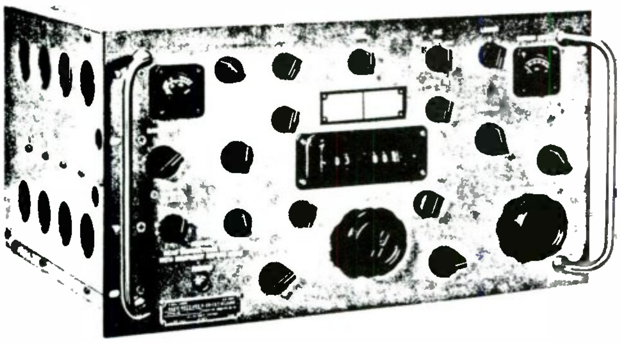
**MODEL:** R-390 **YRS:** 1950-54 **PRICE:** $1421 **BANDS:** 32 1.0 mHz bands, 0.5-32 mHz **TYPE:** Dual conv, fixed hfo from 8-32 mHz, triple conv from0.5-8 mHz **IF:** 9-18 mHz (0.5-8 mHz only), 3000-2000, 455 kHz **FILTER:** Xtal + 455 kHz cascaded L/C **TUBES:** 32 + 1 semi diode, 6AJ5 rf1, 6BJ6 rf2, 6C4 mix1, 6AJ5 xco, 6C4 mix2, 6AJ5 xco, 6C4 mix 3, 5749 vfo, 5 6BJ6 if, 6AK6 if, 12AU7 det/nl, 5749 bfo, 12AU7 af1/sq, 12AU7 nl/agc rect, 12AU7 loc af1/line af1, 6AK6 loc af out, 6AK6 line af out, 6BJ6 agc amp, 12AU7 if k fol/agc time const, 12AU7 calib/buff, 12AU7 multivib, 2 26Z5 rect, 2 6082 vr, 2 5652 vr, 6BH6 DC amp, si rect **ANT IN:** Bal & unbaL MIL style connectors, 42-360 Ω, 125 Ω nom **AF OUT:** Line 0.5 W, 600 Ω, local 0.5 W, 700 Ω **REMARKS:** Redesigned as the R-390A.



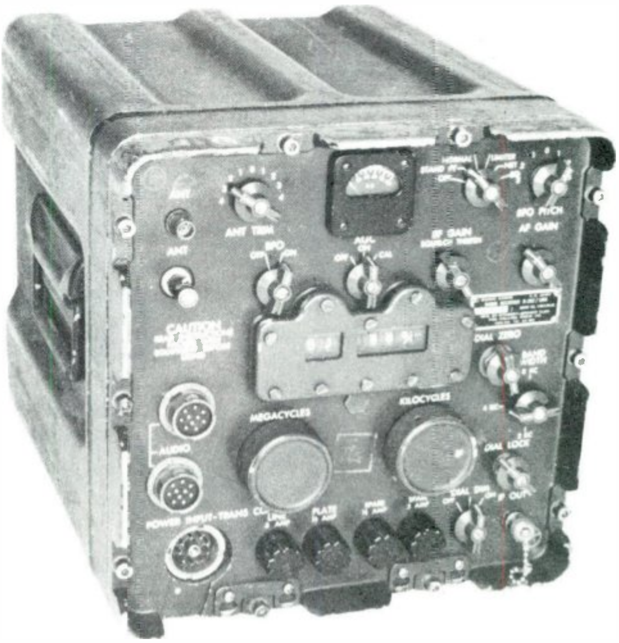
**MODEL:** R-390A **YRS:** 1954-84 **PRICE:** $2500 **BANDS:** 32 1 mHz bands, 0.5-32 mHz **TYPE:** Dual/triple conv, fixed hfo **IF:** 17.5-25 mHz (0.5-8 mHz bands only), 2.5-2 mHz (0.5-1 mHz band only), 3-2 mHz, 455 kHz **FILTER:** Xtal and mech **TUBES:** 24, 6DC6 rf, 6C4 mix 1, 6AK5W xco1, 6C4 mix2, 6AK5W xco2, 6C6 mix3, 6BA6W vfo, 3 6BA6W if, 5814A det/agc time, 5814A k fol/agc rect, 6BA6W agc amp, 5814A af1/k fol, 5814A af2 line/af2 local, 6AK6 af out local, 6AK6 af out line, 6BA6 bfo, 2 26Z5W rect, 0A2 vr, 5814A calib/k fol, 5814A multivib, 5814A lim **ANT IN:** MIL 2 term, bal 50-200 Ω (125 Ω nom, MIL Type C unbal (whip, random wire) **AF OUT:** Local 1 mW 600 Ω phones, 0.5 W spkr, Line 10 mW 600 Ω **REMARKS:** Developed by Collins as reduced cost R-390. Only 525 manufactured by Collins according to one source, another says 6500. One source claims a total of 50,000 R-390As were built, another 140,000. Manufacturers included Collins, Motorola, Stewart-Warner, Electronic Assistance Corp (EAC), Teledyne, Teledyne/Imperial, Dittmore-Freimuth.



**MODEL:** R-391 **FILTER:** Cascaded L/C **TUBES:** 33 **REMARKS:** R-390 with 7 position Collins Autotune added. Built for Sig Corps.



**MODEL:** R-391-A **REMARKS:** R-390A with 7 position Collins Autotune added.



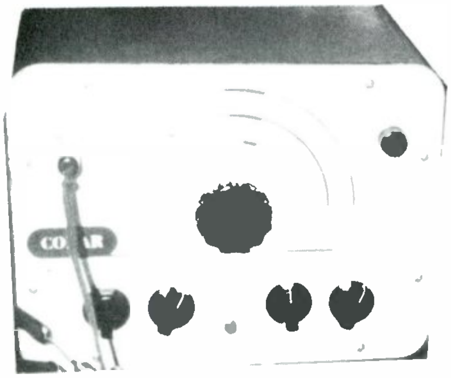
Courtesy *Electric Radio*

**MODEL:** R-392 **YRS:** 1950-1960 **BANDS:** 32 1 mHz bands, 0.5-32 mHz **TYPE:** Dual/triple conv, fixed hfo **IF:** 9.5-18 mHz (0.5-8 mHz bands only), 2-3 mHz, 455 kHz **FILTER:** Cascaded L/C **TUBES:** 25 including 2 rf and 6 if stages - uses 26A7, 26A6, 26C6, 26D6, 6AJ5, 12AU7 **ANT IN:** MIL style conn **AF OUT:** 200 mW, 600 Ω **REMARKS:** Compact, ruggedized R-390, part of GRC-19 vehicular system. Operates from 24-28 VDC.

**MODEL:** R-648/ARR-41 **BANDS:** .19-.55, 2-25 mHz **IF:** 500 kHz **FILTER:** Mech **TUBES:** 17 **REMARKS:** Mini version of R-390A.

## CONAR

Conar was a division of National Radio Institute, 3939 Wisconsin Ave, Washington, DC.



Courtesy *Electric Radio*

**MODEL:** 500 **YRS:** 1965 **PRICE:** $37.50 kit, $56.50 wired **BANDS:** 80, 40, 15 mtrs **IF:** 455 kHz **FILTER:** None **TUBES:** 4 + Ge diode + Si rect, 6BE6 conv, 6BZ6 if1, 6U8A if2/bfo, Ge dx det, 6U8A af1/af2, Si rect **REMARKS:** Internal speaker.

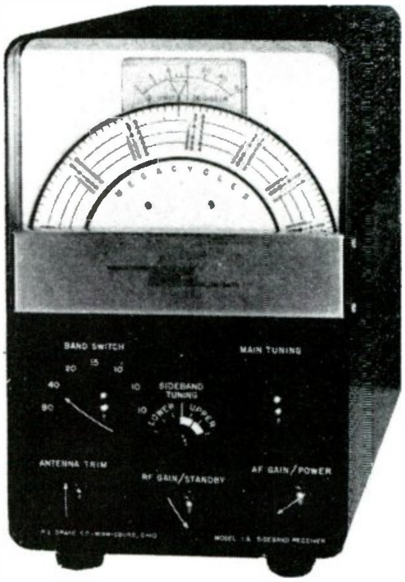
## DRAKE

The R L Drake Company of Miamisburg, Oh, was founded in 1943 by Robert Lloyd Drake in Dayton and originally manufactured high-pass and low-pass RF filters for the ham and military markets. They moved to Miamisburg in 1953 and added a number of small ham accessories to their product line.

Drake entered the receiver business in 1957 with the novel 1-A. The 1-A was the first of the small, modern communications receivers geared to SSB and set the future course for receivers at a time when National and Hallicrafters were still committed to their massive receivers of the past.

The 1-A was followed by the 2- series and, later, by the classic R-4 series which Drake manufactured until 1980. The company abandoned the ham business in the early 1980's in favor of home satellite receivers. However, they re-entered the receiver market in the 1990's with the R8 and R8A top of-the-line general coverage receivers.

R L Drake died in 1975 and Peter W Drake assumed leadership of the company.


MEGACYCLES
BAND SWITCH
MAIN TUNING
SIDEBAND TUNING
LOWER UPPER
ANTENNA TRIM
RF GAIN/STANDBY
AF GAIN/POWER

**MODEL:** 1-A **YRS:** 1957-58 **PRICE:** $299 **TYPE:** Triple conversion, fixed hfo **BANDS:** 7 600 kHz ham bands, 10-80 mtrs **IF:** 2900-3500, 1100, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 11, 6DC6 rf, 6BY6 mix 1, 6AB4 xco, 6BY6 mix2, 6BQ7A vfo/k fol, 6BY6 conv, 12AU7 prod det, 6BF6 avc amp/rect, 12AU7 af1/bfo, 12AQ5 af out, 12X4 rect **ANT IN:** SO-239, 50-75 Ω **AF OUT:** 4 Ω, 1W.

BAND SWITCH
MAIN TUNING
SIDEBAND TUNING
ANTENNA TRIM
RF GAIN/STANDBY
AF GAIN/POWER

## DRAKE

**MODEL:** 1-A (Variation) **YRS:** 1958-59 **PRICE:** $299 **BANDS:** 7 600 kHz ham bands (plus WWV), 10-80 mtrs **TYPE:** Triple conversion, fixed hfo **IF:** 2900-3500, 1100, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 13, 6BZ6 rf, 6AB4 xco, 6BE6 mix1, 6BQ7A vfo, 6BE6 mix 2, 6BY6 conv, 6BZ6 if, 6BJ8 avc amp/rect, 12BA6 calib, 12AU7 prod det, 12AU7 bfo/af1, 12AQ5 af out, 12X4 rect, **ANT IN:** SO-239, 50-75 Ω **AF OUT:**4 Ω **REMARKS:** Internal speaker. Adds crystal calibrator and switch, WWV position, additional IF tube.

PRESELECTOR
FREQUENCY
BAND
RF GAIN
SIDEBAND
AF GAIN
R. L. DRAKE CO.—MIAMISBURG OHIO

**MODEL:** 2-A **YRS:** 1959-61 **PRICE:** $269.95 **BANDS:** 12 600 kHz bands 3.5-30 mHz **TYPE:** Triple conversion, fixed hfo **IF:** 3500-4100, 455, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 10 + Ge rect, 6BZ6 rf, 6U8 mix 1/xco, 6BE6 mix2/vfo, 6BE6 mix3/xco, 6BA6 if, 6BF6 det/avc, 6BE6 prod det/bfo, 6AV6 af1, 1N34 bias rect, 6AQ5 af out, 6X4 rect **ANT IN:** 2 screw term, 50-75 Ω unbal **AF OUT:** 1 W, 4 Ω **REMARKS:** Variation: 6BZ6 IF. Pic is prototype with "Q MULT" 2nd sw from left. Production had "NL".

PRESELECTOR
FREQUENCY
BAND
RF GAIN
PASSBAND
AF GAIN
R. L. DRAKE CO.—MIAMISBURG OHIO

## DRAKE

**MODEL:** 2-B **YRS:** 1961-65 **PRICE:** $279.95 **BANDS:** 12 600 kHz bands 3.5-30 mHz **TYPE:** Triple conversion, fixed hfo **IF:** 3500-4100, 455, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 10, 6BZ6 rf, 6U8 mix1/xco, 6BE6 mix2/vfo, 6BE6 mix 3/xco, 6BA6 if, 6BE6, prod det/bfo, 6BF6 det/avc, 6BN6 af1/bias rect/nl, 6AQ5 af out, 6X4 rect **ANT IN:** 2 screw term, unbal 50-75 Ω **AF OUT:** 1W, 4 Ω **REMARKS:** New passband tuner, improved selectivity.

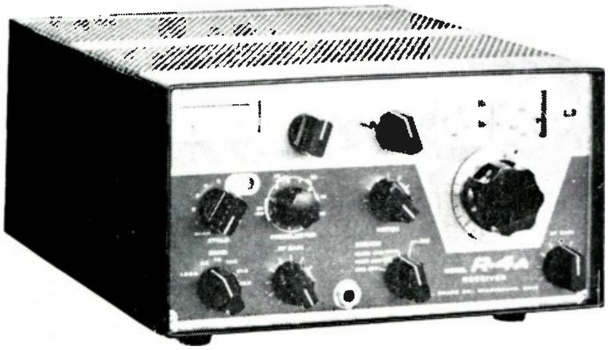
DRAKE 2-C RECEIVER
FUNCTION
PRESELECTOR
BAND
RF GAIN
AF GAIN
MODE
AVC

**MODEL:** 2-C **YRS:** 1966-73 **PRICE:** $229 **BANDS:** 5 500 kHz bands, 3-30 mHz **TYPE:** Triple conversion, fixed HFO **IF:** 3500-4000, 455, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 5 + 3 semi diodes + 7 transistors, 12BZ6 rf, 12AU6 mix1, 2N3394 xco, 12BE6 mix 2/vfo, 12BE6 mix3/xco, 12BA6 if, 1N270 det, 2N3394 af1, 2 IN270 prod det, 2N3394 bfo, 2 2N3394 af, 2N3394 avc amp, 40310 af out **ANT IN:** Phonojack, 50 Ω **AF OUT:** 1.8 W, 4 Ω

R-4 RECEIVER
PRESELECTOR
NOTCH
BAND
XTALS

## DRAKE

**MODEL:** R-4 **YRS:** 1964-66 **PRICE:** $379.95 **BANDS:** 15 500 kHz bands, 1.5-30 mHz **TYPE:** Double conversion, pre-mixer **IF:** 5645, 50 kHz **FILTER:** 50 kHz L/C, 5645 kHz xtal lattice **TUBES:** 13 + 7 semi diodes, 12BZ6 rf, 12BZ6 calib, 6KZ8 mix1/k fol, 6AU6 pto, 2 12BA6 if, 6KZ8 premix/xco, 12BE6 mix2/xco 12AV6 avc amp/det, 6GX6 prod det/af1, 12EH5 af out, 12BA6 nb amp, 12AX7 nb pulse amp/shaper, 1N625 nb gate, 2 IN625 nb pulse clip, 1N625 am det, IN625 bias rect, 2 IN3756 rect **ANT IN:** Phono jack, 52 Ω **AF OUT:** 1.4 W., 4Ω



**MODEL:** R-4A **YRS:** 1966-67 **PRICE:** $399.95 **BANDS:** 15 500 kHz bands 1.5-30 mHz **TYPE:** Double conversion, pre-mixer **IF:** 5645, 50 kHz **FILTER:** 50 kHz L/C, 5645 kHz xtal filter **TUBES:** 14 + 4 diodes, 12BZ6 rf, 6HS6 mix1, 6AU6 vfo, 6KZ8 pre-mix/xco, 12BE6 mix2/xco, 2 12BA6 if, 6GX6 prod det/af1, 12AV6 avc, 6EH5 af out, OB2 vr, 12BA6 calib, 12BA6 noise blank, 12AX7 noise blank, 1N625 noise blank/det, ED-3004 bias rect, 2 IN3756 rect, **ANT IN:** Phono jack, 52Ω **AF OUT:** 1.4 W., 4 Ω

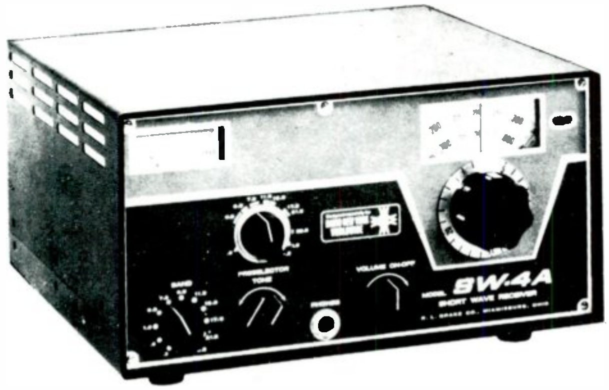
## DRAKE

**MODEL:** R-4B **YRS:** 1968-73 **PRICE:** $430 **BANDS:** 15 500 kHz bands 1.5-30 mHz **TYPE:** Double conversion, pre-mixer **IF:** 5645, 50 kHz **FILTER:** 50 kHz L/C, 5645 kHz xtal lattice **TUBES:** 9 + 10 trans + 17 diodes + 2 ic, 6BZ6 rf, 6SH6 mix1, 12BE6 mix2/xco, 2 12BA6 if, 6EH5 af out, 6HS6 premix, 12BA6 noise blank **ANT IN:** Phono jack, 52Ω **AF OUT:** 1.5 W., 4 Ω

**MODEL:** R-4C **YRS:** 1973-80 **PRICE:** $499.65 **BANDS:** 20 500 kHz bands 1.5-30 mHz **TYPE:** Triple conversion, pre-mixer **IF:** 5695 kHz, 5645, 50 kHz **FILTER:** 5645 kHz xtal lattice, roofing filter, 5695 kHz 8 pole ssb/cw filters **TUBES:** 6 + 15 trans + 23 diodes + 1 ic, 6BA6 rf, 6EJ7 mix1, 6BE6 mix2, 6EJ7 mix3, 6BA6 if, 6EJ7 premix, 2N5950 if1, EP487 power supply filter, 2N5950 source fol, 2N5953 xco, 2N3394 bfo, 2N3394 det/amp, 2N3877 agc, 2N5950 pto, 2N3394 af, 2N3394 af, 40310 af out, 2N3392 xco, 2N3563 pto buf, 2N5950 calib, 2N3394 calib shape, SN7473 calib div, 1N4148 agc, 2 1N270 prod det, 1N270 det, 1N270 premix clamp, 1N714 vr, 5 1N4005 rect, 2 1N4148 agc, 1N5240A vr, 1N4148 premix key, 1N270 calib shape, 1N714 vr, 2 1N4005 rect, 2 1N270 mix3 inj clip, 1N4148 agc, 1N4148 trans sup **ANT IN:** Phono jack, 52 Ω **AF OUT:** 2 W., 3.2 Ω **REMARKS:** "This really is a fabulous receiver...established a standard which is difficult...to beat" (RSGB). Major difference: replaced 50 kHz L/C filter with 5695 kHz 8 pole filters which required an additional conversion and changed PBT to electrical (from mechanical).

## DRAKE

**MODEL:** R4-C (Variation) **TUBES:** 6BZ6 rf, 6HS6 mix1, 6BZ6 mix2, 6BA6 mix3, 6BA6 if, 6456 premix, SCF4982 if1 (Balance of semiconductors same) **REMARKS:** Different tubes, different if1 transistor, 2 cw filter positions (vs 3).


SW-4A
SHORT WAVE RECEIVER
R. L. DRAKE CO., MIAMISBURG, OHIO
PRESELECTOR
TONE
VOLUME ON/OFF
BAND
PHONES

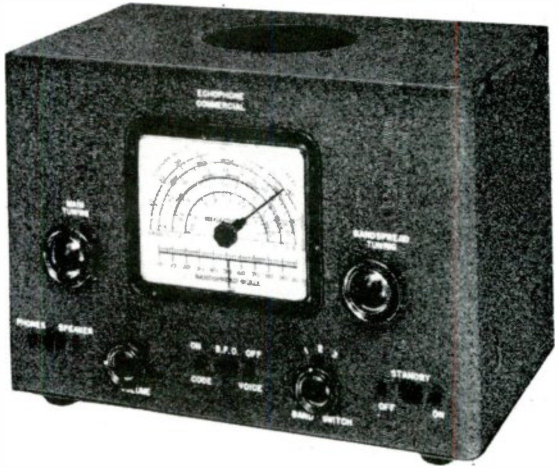
**MODEL:** SW-4A **YRS:** 1966-67 **PRICE:** $299.00 **BANDS:** 11 500 kHz bands, LW, MW, 49, 40, 31, 25, 19, 16, 15, 12 mtr SWBC **TYPE:** Double conversion, premixer **IF:** 5645, 455 kHz **FILTER:** Xtal lattice 5645 kHz **TUBES:** 6 + 7 trans + 8 diodes, 12BZ6 rf, 6HS6 mix1, 6HS6 premix, 12BE6 mix2, 2 12BA6 if, 2N706 vfo, 2N3858 vfo buff, 2N3858 agc amp, 2 2N3394 af1, 40310 af out, 1N714 vr, 1N270 det, 1N483 avc clamp, 4 1N3194 rect, 1N3194 bias rect, 2N3394 premix xco **ANT IN:** Term, 52 Ω **AF OUT:** 2 W 4/8 Ω **REMARKS:** International SWBC receiver, no BFO or SSB/CW filters

## ECHOPHONE

The Echophone Radio Co started in the early 1920's in Southern California where they owned radio stations and manufactured home broadcast receivers. In 1930 they moved to Waukegan, IL, where the company turned out 1000 sets per day. They changed management in 1931 and later moved to 2611 Indiana Avenue in Chicago, The depression and financial difficulties hit Echophone in the mid 1930's and they finally suspended business in August, 1936.

Ray Durst, an Echophone executive got together with Bill Halligan, president of Hallicrafters, and they worked out a deal where Hallicrafters acquired the Indiana Avenue plant and Echophone's RCA manufacturing licenses. Hallicrafters moved their entire operation into the plant on August 15, 1936. Ray Durst became Hallicrafters vice president.

The Echophone name went into limbo until 1940 when Hallicrafters wanted to come out with a line of very low priced communications receivers. Rather than tarnish the Hallicrafters and Skyrider images they put the new sets out under the Echophone name. The sets were designed and produced in the Hallicrafters facility by Hallicrafters personnel.

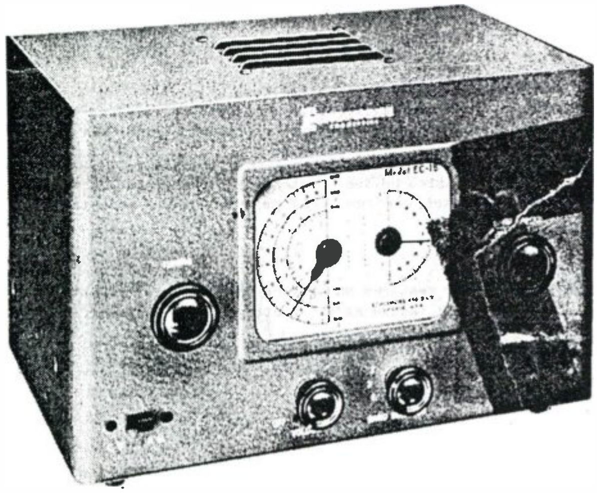

ECHOPHONE COMMERCIAL
MAIN TUNING
BANDSPREAD TUNING
PHONES
SPEAKER
ON
B.F.O.
OFF
CODE
VOICE
BAND SWITCH
STANDBY
OFF
ON

**MODEL:** Echophone Commercial EC-1 **YRS:** 1940-44 **PRICE:** $19.95 ($24.50 1942) **BANDS:** 3, .545-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 12K8 conv, 12SK7 if, 12SQ7 det/avc/af1, 12J5 bfo, 35L6 af out, 35Z5 rect **ANT IN:** 3 Term, 330 Ω **AF OUT:** High Z phones **REMARKS:** AC/DC, internal speaker.

Echophone
Model EC-1A
TUNING
BAND SPREAD
C.W.
A.M.
OFF
ON
NOISE LIMITER
VOLUME
BAND SEL.
PHONES
SPEAKER
STANDBY
OFF
ON

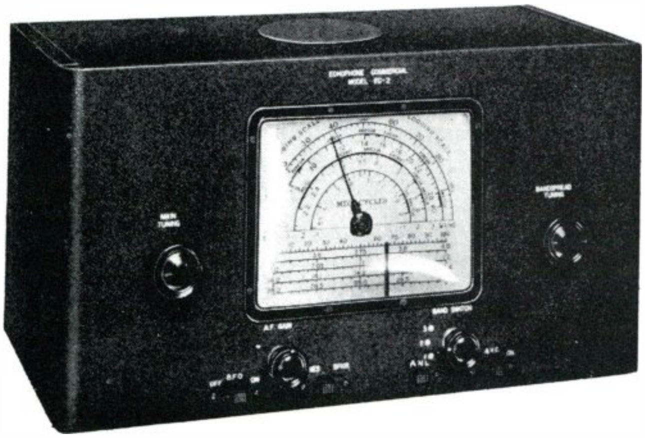
## ECHOPHONE

**MODEL:** EC-1A **YRS:** 1945 **PRICE:** $29.50 **BANDS:** 3, .55-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 12SA7 conv, 12SK7 if, 12SQ7 det/avc/af1, 12SQ7 bfo/nl, 35L6 af out, 35Z5 rect **ANT IN:** 3 Term, 330 Ω **AF OUT:** High Z phones **REMARKS:** AC/DC, internal speaker.



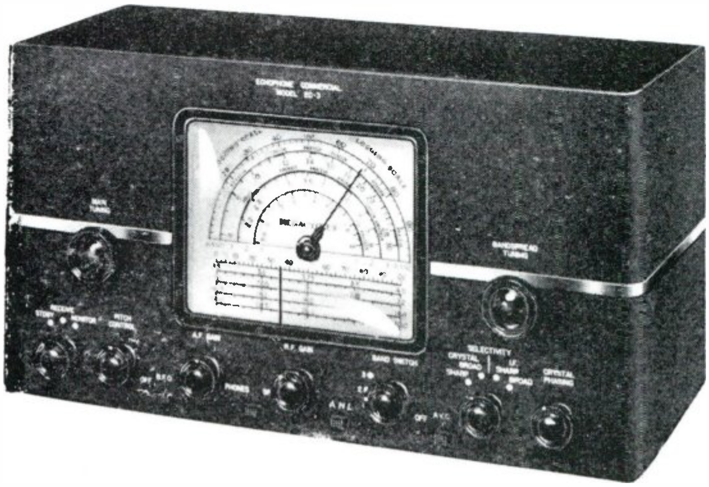
**MODEL:** EC-1B **YRS:** 1945 **BANDS:** 3, .55-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 12SA7 conv, 12SK7 if, 12SQ7 det/avc/af1, 12SQ7 bfo, 35L6 af out, 35Z5 rect **ANT IN:** 3 Term, 330 Ω **AF OUT:** High Z phones **REMARKS:** AC/DC, internal speaker. Eliminates noise limiter and phones/speaker switch placed on rear apron. Info from manual dated December, 1945.

**MODEL:** EC-1B (Variation) **REMARKS:** Dachis shows an EC-1B with same front panel as EC-1A.

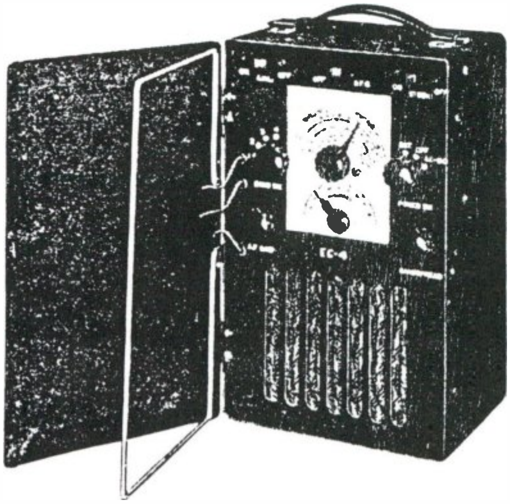


## ECHOPHONE

**MODEL:** EC-2 **YRS:** 1941-43 **PRICE:** $29.95 **BANDS:** 3, .55-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 7 + ballast, 6SG7 rf, 6K8 conv, 6SK7 if, 6H6 det/avc/nl, 6SC7 bfo/af1, 25L6 af out, 25Z6 rect **ANT IN:** 3 Term, 330 Ω **AF OUT:** High Z phones **REMARKS:** AC/DC, internal speaker.



**MODEL:** EC-3 **YRS:** 1941-43 **PRICE:** $49.95 **BANDS:** 3, .545-30 mHz **IF:** 455 kHz **FILTER:** crystal **TUBES:** 9, 6SG7 rf 6K8 conv, 2 6SK7 if, 6H6 det/anl/avc, 6SC7 bfo/af1, 25L6 af out, 25Z6 rect, ballast **ANT IN:** 3 term, 330 Ω **AF OUT:** High Z phones, low Z speaker **REMARKS:** AC/DC.



**MODEL:** EC-4 **YRS:** 1941-42 **PRICE:** $49.50 **BANDS:** 4, .545-32 mHz **TUBES:** 9 **REMARKS:** Portable, 115V. AC/DC, battery, internal speaker, 2 loop antennas.

## ECHOPHONE

**MODEL:** EC-6 **YRS:** 1945 **BANDS:** 3, .55-19 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 7, 1R5 conv, 2 IN5 if, 1H5 det/avc/af1, 50L6 af out (ac/dc/). 3Q5 af out (battery). 35Z5 rect **REMARKS:** AC/DC/battery portable BC receiver. int spkr. Same as Hallicrafters RE-1.

## EICO

Electronic Instrument Co (EICO) operated from a number of addresses in the New York area, 33-00 Northern Blvd, Long Island City 1, NY, 84 Withers St, Brooklyn 11, and 131-01 39th Ave. Flushing 11352. They were a major competitor of Heathkit in the kit test equipment field.

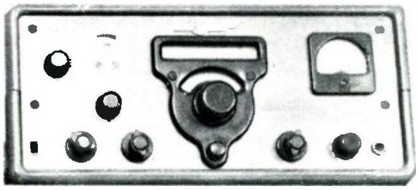
**MODEL:** 711 Space Ranger **YEARS:** 1967 **PRICE:** Kit $49.95, wired $69.95 **BANDS:** 4, .55-30 mHz **REMARKS:** Available kit or wired.

## ELDICO

Eldico was a prominent manufacturer of ham transmitters and accessories in the 1950's. The company was founded by Paul Wright, W90HM. Around 1957 they became a division of Dyamics Corporation of America and later, 1958 and 1959, their ads showed them as a division of Radio Engineering Labs, Long Island City, NY. Old timers will remember REL from the 1930's when they manufactured regenerative receivers and transmitters.

According to John Moriarity, K6QQ, Eldico second sourced the Collins S-line for a military contract and when the contract ended they decided to produce the equipment commercially as the R-119 "amateur special SSB communication system" consisting of the T-102 transmitter and the R-104 receiver, along with accessory units. Internally, and to an extent externally, the sets were clones of the S-line. Collins was apparently unhappy with this and Eldico ceased production but not before at least a few units reached the field.

## ELDICO



**MODEL:** R-104 **YRS:** 1960 **BANDS:** 14 200 kHz bands 3.5-30 mHz **TYPE:** Double conversion, fixed HFO **IF:** 2855-3055, 455 kHz **FILTER:** Mech **TUBES:** 11 + 5 Si Rect, + 1 Ge diode, 6DC6 rf, 6DC6 xtal calib, 6AH6 xco, 6BE6 mix1, 6BE6 mix2, 6U8A vfo/k fol, 2 6BA6 if, 6BE6 prod det, 6AT6 am det/avc/af1, 6AQ5 af out, 1N34A switch, 5 Si rect **AF OUT:** 0.75 W **REMARKS:** Clone of 75S-1. Manual dated 5/12/60.

## FEDERATED PURCHASER

Federated Purchaser, 25 Park Place, NYC, offered a kit or assembled receiver designed by Clifford Denton, their chief engineer. Denton was a popular radio writer of the 1930's.

**MODEL:** 30A Master Explorer **YRS:** 1933 **TUBES:** 8

## GENERAL ELECTRIC

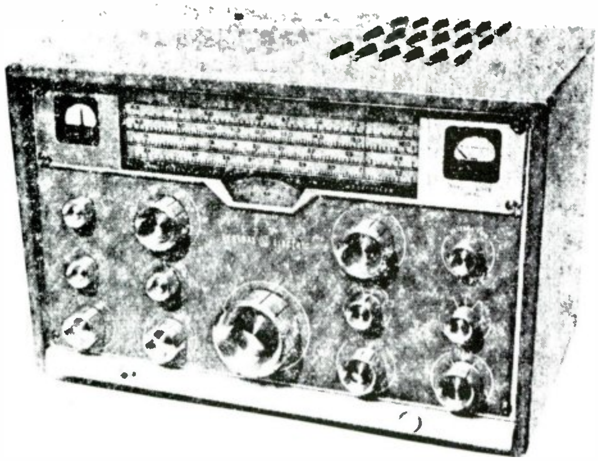
During the early 1950's a great debate raged over the phone transmission method of the future. Advocates claimed SSB had a 9 dB power advantage over AM, it eliminated heterodynes and saved spectrum space.

## GENERAL ELECTRIC

Then in 1956 Dr. John P Costas of General Electric, Syracuse, NY, developed a new system. He proposed DSB, regular DSB AM transmitted without the carrier. DSB resulted in simpler transmitters than either SSB (no filtering or phasing of the unwanted sideband) or AM (no powerful carrier) and it had the same power advantage as SSB. DSB also was less affected by QRM and jamming.

Costas developed a synchronous detector known as the "Costas loop" in which a VCO is controlled by information derived only from the two side-bands. Other synchronous detectors require at least a pilot carrier.

The Air Force awarded GE a contract to develop a DSB system based on the Costas loop. The receiver was unique in being the only serious direct conversion communications receiver.

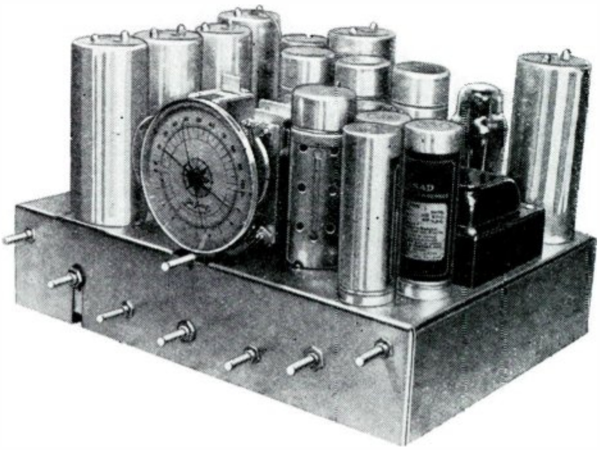


**MODEL:** FRR-48 **YRS:** 1956 **BANDS:** 4, 4-32 mHz **TYPE:** Direct conversion **IF:** None **FILTER:** Audio **REMARKS:** Prototype, part of DSB system for the Air Force.

## GENERAL MANUFACTURING

The General Manufacturing Co, Chicago, was a coil manufacturer. They put out a kit receiver using their coils.

## GENERAL MANUFACTURING



**MODEL:** Super DX-8 **YRS:** 1935 **BANDS:** 4, 1.6-18 mHz **IF:** 507 kHz **FILTER:** Crystal, (Optional) **TUBES:** 8, 58 rf, 2A7 conv, 58 if, 2A6 det/avc/af1, 56 bfo, 56 af2, 2A5 af out, 80 rect **ANT IN:** 3 binding posts, bal/unbal **REMARKS:** Kit with preassembled front-end unit.

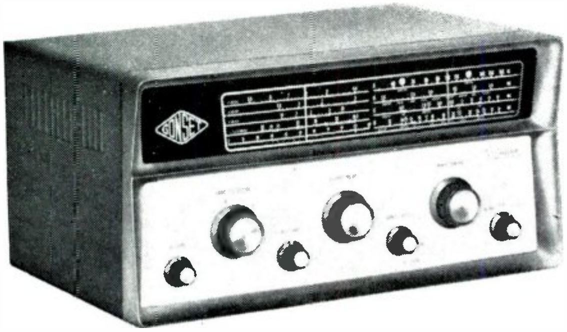
## GILFILLAN BROS

Gilfillan Brothers, 1815 Venice Blvd, Los Angeles, controlled radio manufacturing on the West Coast because, in 1927, they acquired the exclusive RCA license for the Western states. All receivers manufactured in the area had to be assembled in the Gilfillan plants. Thus, although they manufactured no communications receivers of their own, they assembled the chassis for Breting, Patterson and Pierson-Delane in their Los Angeles plant. It is not known where the other major West Coast communications receiver company, E. M. Sargent of San Francisco, had their sets assembled.

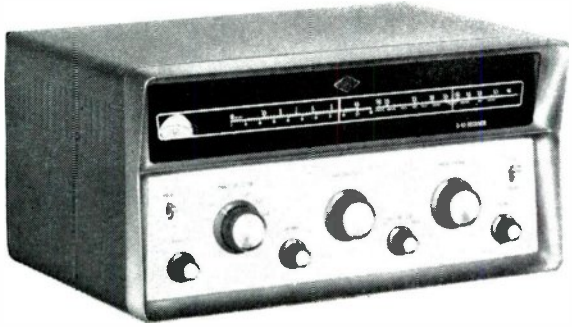
Sennett W. Gilfillan and Jay G. Gilfillan started the company in 1912 to refine precious metals. They started making radio components in 1922 and complete sets in 1924, continuing until 1948. During the 1930's they made home broadcast receivers under their own name and assembled chassis for up to twenty other companies. They survive today as ITT Gilfillan, manufacturers of military/aerospace components and electronic systems.

## GONSET

Gonset Co. 801 S Main St, Burbank, CA, was founded by Faust Gonsett in the early 1950's. Gonsett was a well known radio engineer in the LA area in the 1930's and was a writer and lab engineer for *Radio*. In the late 1950's they became a division of Young Spring and Wire Corp and in 1968 became "Another division of Aerotron, Inc," in Raleigh, NC. They were best known for their line of VHF transceivers. Note Faust Gonsett spelled his name with two "t's", the company name had only one "t." Gonsett resurfaced in 1962 as the founder of Sideband Engineers which introduced one of the first solid state communications receivers as part of the SB-33 transceiver.

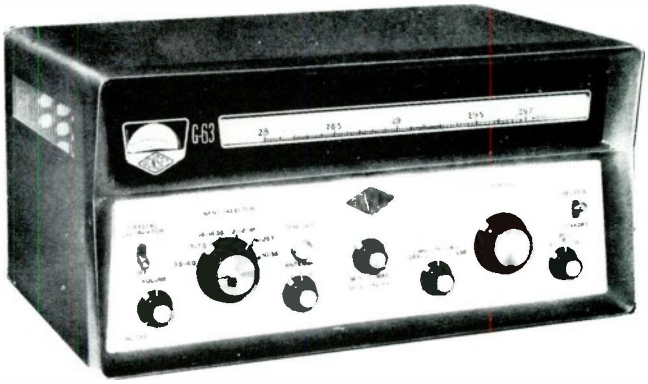


**MODEL:** G-33: **YRS:** 1958-61 **PRICE:** $89.95 **BANDS:** 4, .54-34 mHz **IF:** 1650 kHz **FILTER:** None **TUBES:** 6, 6BE6 conv, 6BA6 if1, 6BA6 if2/bfo, 6AV6 det/avc/af1, 6CM6 af out, 6X4 rect **REMARKS:** Internal 4" speaker. Drum type dial displays only band in use.

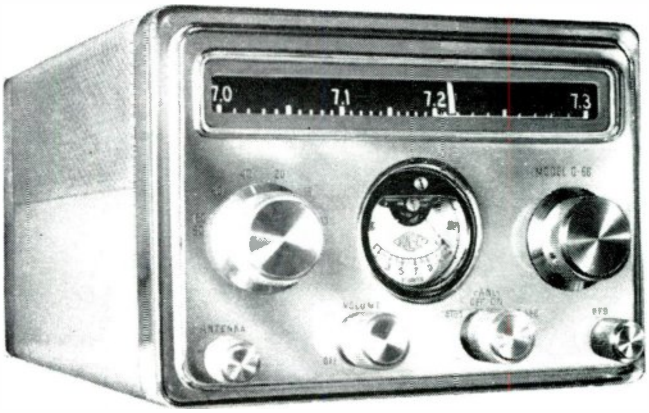


**MODEL:** G-43 **YRS:** 1958-61 **PRICE:** $159.50 **BANDS:** 6, .54-30 mHz **IF:** 1650 kHz **FILTER:** None **TUBES:** 8, 6BE6 conv, 2 6BA6 if, 6AU6 if3, 6AL5 det/avc/anl, 12AX7 af1/bfo, 6CM6 af out, 6X4 rect **REMARKS:** Internal 4" speaker. Drum type dial displays only band in use.

## GONSET

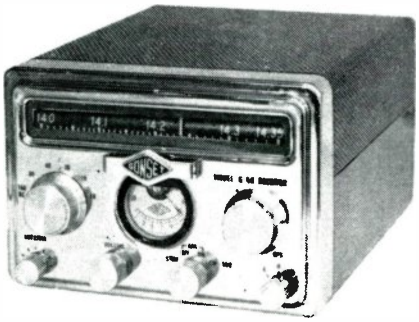


**MODEL:** G-63 **YRS:** 1959-61 **PRICE:** $239.50 **BANDS:** 6 ham bands, 80 - 6 mtrs **TYPE:** Double conversion, variable hfo **IF:** 2085, 262 kHz **FILTER:** Q Multiplier **TUBES:** 11, 6BZ6 rf, 6U8A mix/hfo, 6BE6 conv, 2 6BA6 if, 6AL5 det/avc/anl, 6BE6 prod det/bfo, 12AX7 af1/q mult, 6AQ5 af out, OB2 vr, 5Y3 rect **REMARKS:** Drum type dial displays only band in use.



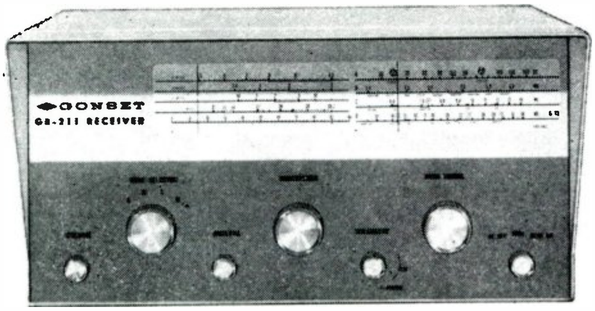
**MODEL:** G-66: **YRS:** 1955-56 **PRICE:** $169.50 **BANDS:** 6, BC + 80-10 mtrs **TYPE:** Double Conversion, variable hfo **IF:** 2050, 262 kHz **FILTER:** 262 kHz L/C **TUBES:** 9, 6DC6 rf, 6U8 mix/buf, 6C4 hfo, 6BE6 mix2/xco, 6AU6 if, 6AL5 det/avc/nl, 6AW8 af1/bfo, 6AQ5 af out, OB2 vr **AF OUT:** 3 W. **REMARKS:** Separate power supply.

## GONSET

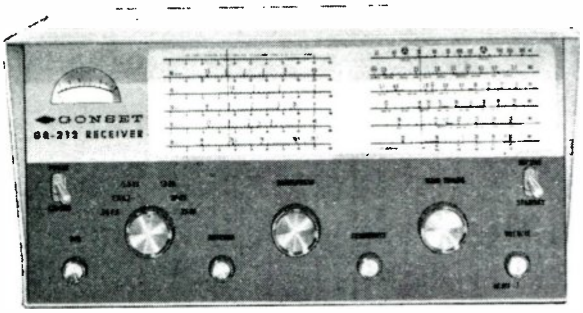


**MODEL:** G-66B **YRS:** 1957-59 **PRICE:** $189.50 **BANDS:** 6, BC + 80-10 mtrs **TYPE:** Double Conversion, tunable hfo **IF:** 2050, 262 kHz **FILTER:** 8 262 kHz L/C circuits **TUBES:** 10 **REMARKS:** Separate power supply. Distinguished by emblem above "S" meter. Selectivity improved with additional 262 kHz IF stage.

**MODEL:** GE43 **YRS:** 1961 **PRICE:** $99.50 **BANDS:** .54-30 mHz **TUBES:** 7 **REMARKS:** Internal speaker, drum type dial displays only band in use.



**MODEL:** GR-211 **YRS:** 1961-62 **PRICE:** $69.50 **BANDS:** 4, .54-34 mHz **TUBES:** 5 + 2 semi rectifiers **REMARKS:** Internal speaker.

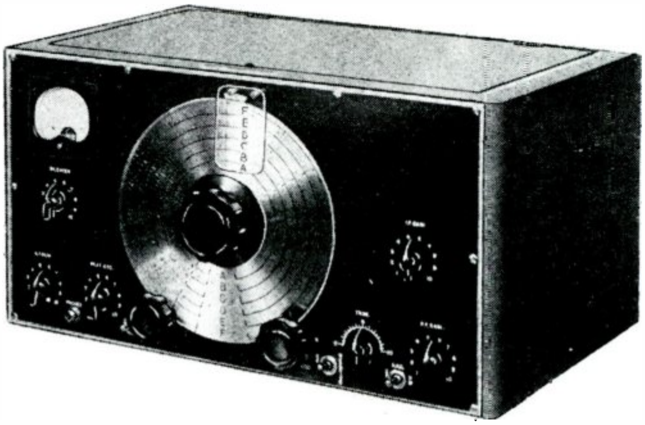


## GONSET

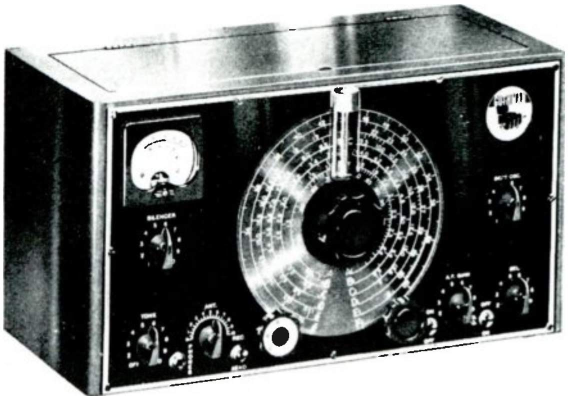
**MODEL:** GR-212 **YRS:** 1961-62 **PRICE:** $99.50 **BANDS:** 6, .54-34 mHz **TYPE:** Double conversion, tunable hfo **IF:** 1650, 455 kHz **FILTER:** None **TUBES:** 7 + 2 semi rect, 6U8 mix1/hfo, 6BA6 if1, 6BE6 mix2/xco, 6BA6 if2, 6AL5 det/avc/nl, 12AX7 af1/bfo, 6AQ5 af out, 2 semi rect **REMARKS:** Internal speaker.

## GUTHMAN

Edwin I. Guthman & Co., So. Peoria St., Chicago, IL, hired the peripatetic McMurdo Silver as chief engineer after his latest company folded in 1938. Silver designed a line of ham equipment for Guthman which included two receivers.



**MODEL:** U-17 Silver Super **YRS:** 1939 **PRICE:** $49.50 **BANDS:** 6, .54-61 mHz **IF:** 455 kHz **FILTER:** Regenerative if **TUBES:** 8, 6K8 conv, 7A7 if, 6B8 det/avc/af1/nl, 7A7 bfo, 7A7 mtr amp, 6V6 af out, VR150 vr, 80 rect **ANT IN:** 3 screw term, high Z **AF OUT:** Phones high Z, 4.25 W. **REMARKS:** Kit, regenerative mixer and IF amplifier. A variation uses a 6SF5 as the meter amp.



## GUTHMAN

**MODEL:** U-50K/W **YRS:** 1939-40 **PRICE:** $57.45 assembled, $49.95 kit **BANDS:** 6, .525-62 mHz **IF:** 455 kHz **FILTER:** Regenerative if **TUBES:** 11. 7A7 rf, 6K8 conv, 2 6SK7 if, 6B8 det/avc/af1/nl, 6J5 bfo, 6SF5 meter amp, 2 7C5 p/p af out. VR-105 vr, 80 rect **ANT IN:** 3 screw term **AF OUT:** 12 W. **REMARKS:** K = kit, W = wired.

## HALLICRAFTERS

The most famous name in communications receivers, The Hallicrafters, Inc., was formed in September, 1933, and their first advertisement for the H-13 all-wave BC type receiver, appeared the same month in *Ra*dio News under the Silver-Marshall Mfg Co. name and address. A short time later the Silver-Marshall Mfg Co. issued their 1934 catalog devoted exclusively to the Hallicrafters line of home receivers. According to the catalog "Radio receivers bearing the Hallicrafters name will be the handmade product of an unfettered group of radio craftsmen."

William Halligan, a Bostonian, who moved to Chicago in 1928, was an engineer who had a manufacturers rep business in the Chicago area. Business was not good in the early 1930's so he decided to get into manufacturing. Silver-Marshall Mfg Co. was a dummy corporation set up in 1929 solely to hold shares in Silver-Marshall Inc. When the latter went bankrupt in 1932 its stock became worthless leaving Silver-Marshall Mfg Co. with only its name as an asset. There was no equipment, no factory, no inventory. Halligan (Hallicrafters) acquired the right to use their name and corporate address. Kendall Clough, formerly chief engineer for Silver-Marshall Inc., joined him and designed the new line of receivers.

Their first communications receiver, the S-1 Skyrider, a five tube regenerative TRF, appeared in the April, 1934, *Radio News*. In October, 1934. Hallicrafters announced their 1935 line consisting of the first Hallicrafters superheterodyne communications receiver. the seven tube Super-Skyrider which was similar to the later S-4 series. the five tube TRF and a "Deluxe All-Wave Superhet" BC type receiver.

Hallicrafters led a precarious existence during its early years. It did not have the vital RCA licenses and was constantly under financed. Late in 1934 they discontinued using the Silver-Marshall name and moved from the old Silver-Marshall address, 417 North State Street, to 3001 Southport Avenue, Chicago, where they remained until early 1936. During this period they may have assembled a few receivers in spite of the lack of an RCA license but most of their sets were contracted out to Howard Radio. There is evidence that some sets were also made by RCA.

Hallicrafters finally got their RCA licenses when Halligan formed a partnership with Arthur Case of another troubled company, Case Electric Co. of Marion, IN. Case Electric had the licenses and a good plant and Hallicrafters moved to Marion in April, 1936. However, the relationship did not work well and the company was still in financial difficulties when Bill Halligan got together with Ray Durst, an executive with the foundering Echophone Radio Co., a couple of months later. Echophone had a large plant at 2611 Indiana Avenue, Chicago, and the RCA manufacturing licenses. They worked out a deal and Hallicrafters acquired the Echophone assets and four months after moving to Marion, they moved back to Chicago on August 15, 1936. The company remained at 2611 Indiana Avenue until they built a new plant at 4401 West Fifth Avenue, Chicago, after World War II. Ray Durst became a Hallicrafters vice president and second in command.

Meanwhile, in 1935, developments in the receiver field came fast and Hallicrafters twice revamped its line during the year. Three new models of the Super Skyrider, the S-4, S-5 and S-6,

## HALLICRAFTERS

differing in the frequency ranges covered, were introduced in January. An optional crystal filter added an "X" to the model designation, i. e., SX-4. In September a revised Super Skyrider, a nine tube set designated the SX-9, was the first communications receiver to use metal tubes and iron core IF transformers.

From 1936 Hallicrafters offered a complete line of receivers starting with the $29.50 Sky Buddy. After moving to the Indiana Ave plant they also did contract work building receivers for McMurdo Silver and others who had no RCA licenses. By the end of the decade the model numbers had reached SX-24. The Super Skyrider line went on to include the SX-11, SX-16, SX-17, SX-28 and SX-28A.

During this period Hallicrafters specialized in giving the most possible features for the dollar and in bringing new developments to the market in the fastest possible time. They did this by using almost all purchased components, capitalizing wherever possible on the low-priced, high-volume parts developed for broadcast receivers.

World War II came and Hallicrafters changed over to war production. Many of the prewar Hallicrafters receivers and transmitters were used almost as is for wartime communications. The company produced 50,000 SX-28s and 18,000 HT-4 transmitters for the war effort. The S-29 portable receiver and the S-36 VHF receiver were also produced in volume.

After the war Hallicrafters plunged back into the amateur communications business with a long line of new models. At the low end of the line was the S-38, the successor to the Sky Buddy, which appeared to be a repackaged Echophone EC-1A. The first top-of-the-line postwar model was the SX-42, the first receiver to use the new miniature tubes developed during the war. It used two 6AG5's as RF amplifiers.

In the late 1940's the company returned to the consumer field for the first time since 1934 with a line of television receivers and high fidelity receivers and amplifiers. The market turned out to be too competitive and unprofitable and the line was soon dropped.

The 1950's were troubled but innovative years for Hallicrafters. Bill Halligan sold the company and then bought it back again. The S-76, introduced in 1951, was the first of a long line of double conversion receivers using the dual intermediate frequencies of 1650 and 50 kHz. The 50 kHz L/C circuits provided for a versatile, switchable selectivity system. By the end of the decade the receiver model numbers had reached SX-111 and the line of great receivers was almost at its end.

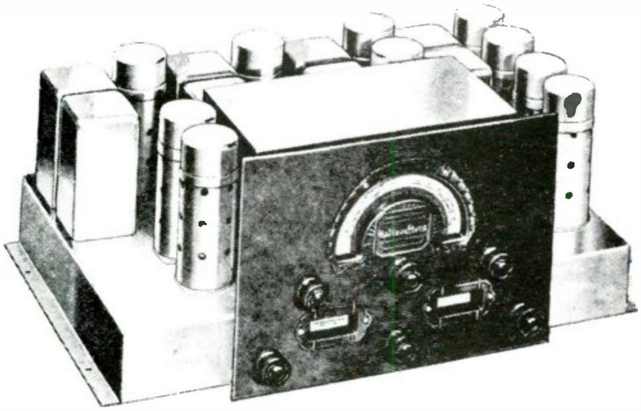
Northrop Corporation acquired Hallicrafters in 1966 and located it in Rolling Meadows, IL., where it became largely a defense electronics manufacturer. It was moved to Dallas later in 1966. Hallicrafters had peak sales of $200 million in the late 1960's but then declined sharply. In 1972 sales dropped to 50% of the 1970 level.

Hallicrafters became the Hallicrafters Division of Wilcox Electric, moving back to Rolling Meadows, IL, in 1974. Braker Corporation acquired Hallicrafters in 1976 and moved it to Grand Prairie, TX. Sales had dropped to $1.3 million in 1979 when they shut down. The last mention of Hallicrafters came in an item in *Electronic News* in June, 1980, which said that Hallicrafters would resume business in a new plant in Miami.

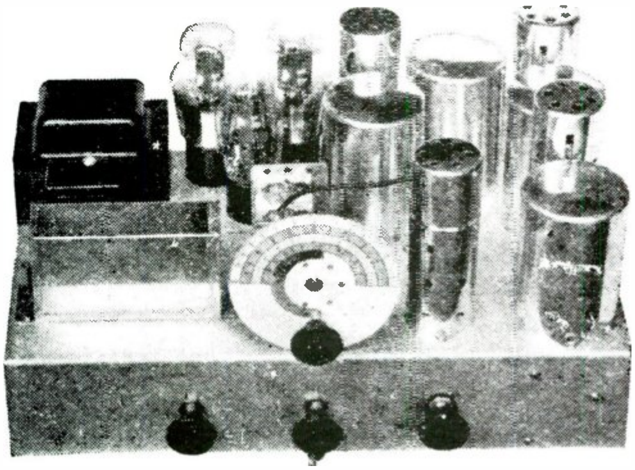
William J. Halligan died 7/14/92 in Miami Beach, FL, at the age of 93.

**MODEL:** Z-13: **YRS:** 1933 **REMARKS:** Believed same as H-13.

## HALLICRAFTERS



**MODEL:** H-13 Round The World Receiver **YRS:** 1933 **BANDS:** 4, .52-21 mHz **IF:** 465 kHz **FILTER:** Cascaded L/C Clough Quadro Tuned IF **TUBES:** 13, 58 mix, 56 hfo, 3 58 if, 56 det, 56 af1, 56 bfo, 56 avc, 56 mtr amp, 2 2A3 af out, 5Z3 rect **AF OUT:** 15 W **REMARKS:** Manufactured by Silver-Marshall. BC type receiver with separate audio amplifier and power supply.



**MODEL:** Z-10 **YRS:** 1934 **PRICE:** $86.50 for chassis and speaker ($49.95) **BANDS:** 4, .525-30 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 7, 2A7 conv, 58 if, 2B7 if/det/avc, 58 bfo, 2 2A5 af out, 5Z3 rect **AF OUT:** 5W. **REMARKS:** Mfg by Silver-Marshall, BC type receiver. "$49.95. . .$5.00 pinned to this coupon brings you the Z-10. . .pay postman the balance." *Radio News* 2/34.

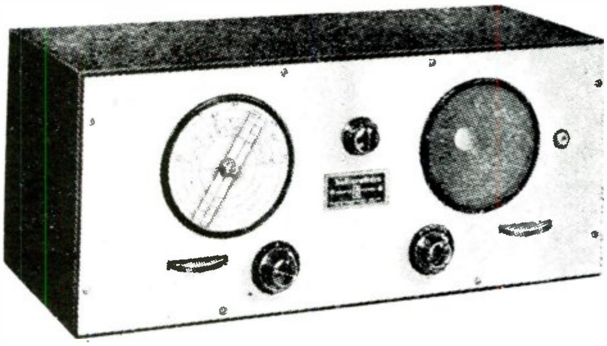
## HALLICRAFTERS

PICTURE

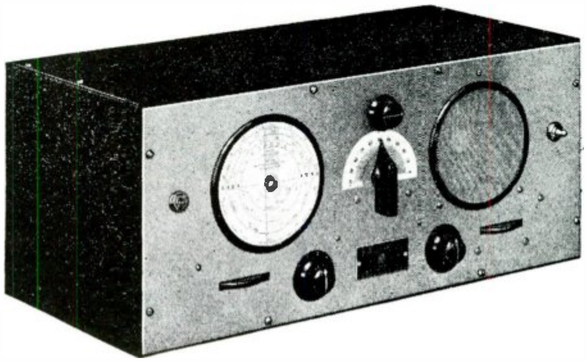
NOT

AVAILABLE

**MODEL:** Z-DELUXE All Wave Super **YRS:** 1934 **PRICE:** $139.50 for chassis and 12" speaker **BANDS:** .150-23 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 13, 58 mix, 56 hfo, 3 58 if, 56 det, 56 af1, 56 bfo, 56 avc, 56 mtr amp, 2 2A5 af out, 5Z3 rect **AF OUT:** 5 W **REMARKS:** Mfg by Silver-Marshall, BC type receiver. Similar to H-13 except reduced AF output and does not use Quadro Tuned IFs. 1934 catalog says, "successor to Z-13."



**MODEL:** S-1 Skyrider **YRS:** 1934 **PRICE:** $39.95 **BANDS:** 4, 1.5-25 mHz **TYPE:** Regenerative TRF **FILTER:** None **TUBES:** 5, 6D6 rf, 6D6 regen det, 6C6 af1, 42 af out, 80 rect **ANT IN:** 3 wires, bal/unbal **REMARKS:** Internal speaker.



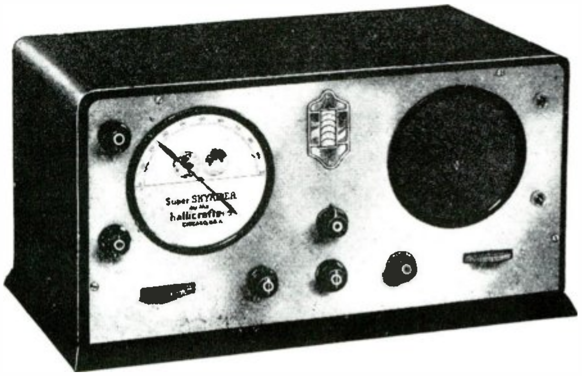
## HALLICRAFTERS

**MODEL:** S-1 Skyrider "special" **YRS:** 1934 **PRICE:** $49.95 **REMARKS:** Same as S-1 Skyrider with addition of bandspread control

**MODEL:** S-1 Skyrider "standard" battery model **PRICE:** $42.50 **REMARKS:** Tube line-up not known.

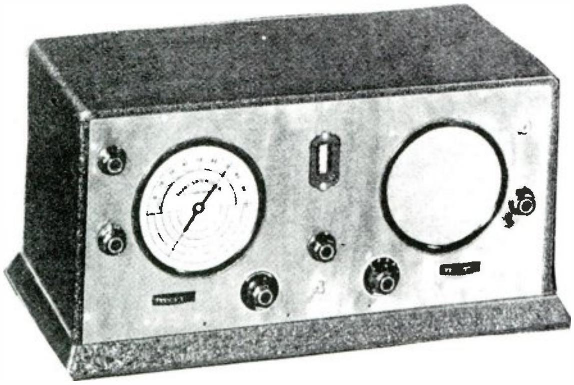
**MODEL:** S-1 Skyrider "special" battery model **PRICE:** $59.50 **REMARKS:** Tube lineup not known.

**MODEL:** Skyrider "standard" (1935 model) **YRS:** 1934-35 **PRICE:** $39.95 **REMARKS:** Same as S-1 Skyrider "special."



**MODEL:** Super Skyrider **YRS:** 1934-35 **PRICE:** $59.95 **TUBES:** 7 **AF OUT:** 3 W. **REMARKS:** Part of "the new Hallicrafters 1935 line," internal speaker. Believed to be protoype for S/SX-4 series. Pic used in ads Oct, 1934, to Feb, 1935.

**MODEL:** De Luxe All Wave Superhet **YRS:** 1934-35 **BANDS:** .15-23 mHz **REMARKS:** BC type receiver, part of "the new Hallicrafters 1935 line."

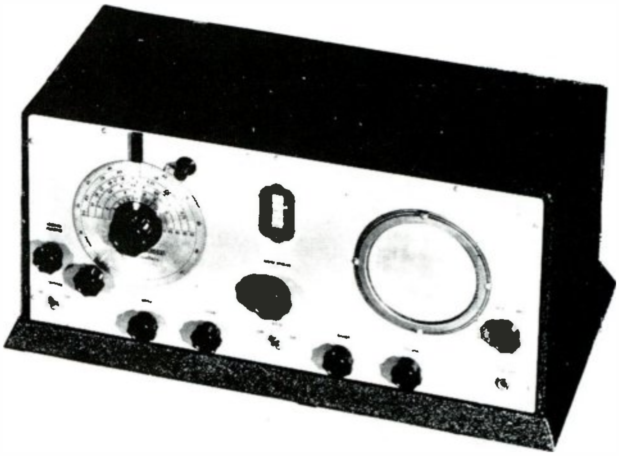


## HALLICRAFTERS

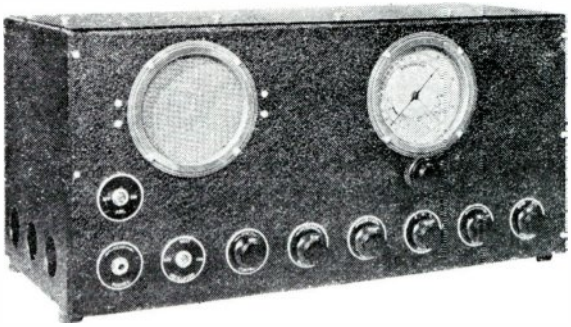
**MODEL:** S/SX- 4 Super Skyrider **YRS:** 1935 **PRICE:** $59.95, $68.95 w/xtal **BANDS:** 4, 1.3-21 mHz **IF:** 465 kHz **FILTER:** "S" none, "SX" xtal **TUBES:** 7, 6D6 rf, 6A7 conv, 2 6D6 if, 6F7 det/bfo, 42 af out, 80 rect **ANT IN:** 2 wire (Green ant, Black gnd), unbal, high Z **AF OUT:** 3 W. **REMARKS:** Internal speaker.

**MODEL:** S/SX-5 Super Skyrider **PRICE:** $69.95, $79.95 w/xtal **BANDS:** 5, .54-21 mHz **REMARKS:** Same as S/SX-4 except price and band coverage.

**MODEL:** S/SX-6 Super Skyrider **PRICE:** $69.95, $78.95 w/xtal **BANDS:** 5, 1.3-30 mHz **REMARKS:** Same as S/SX-4 except for price and band coverage.

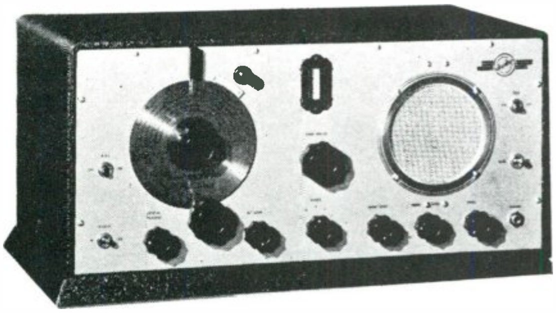


**MODEL:** S/SX-7 Super Skyrider **YRS:** 1935 **PRICE:** $79.50, $89.50 w/xtal **BANDS:** 5, .54-48 mHz **IF:** 465 kHz **FILTER:** "S" none, "SX" xtal **TUBES:** 9, 6K7 rf, 6L7 mix, 6C5 hfo, 6K7 if, 6H6 det/avc, 6K7 bfo, 6F5 af1, 6F6 af out, 5Z4 rect **REMARKS:** Internal speaker. Believed to be prototype for S-9, model no. changed to avoid confusion with Super-7.

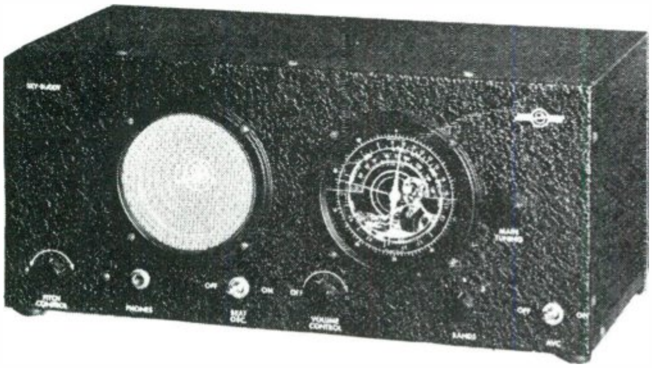


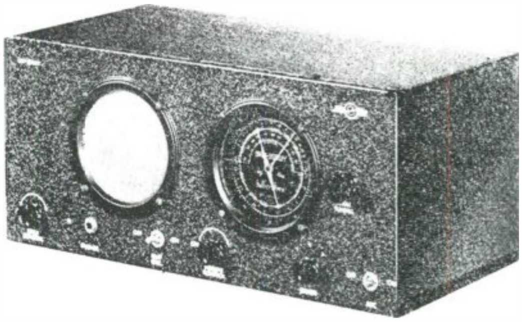
**MODEL:** Super-7 **YRS:** 1935 **PRICE:** $49.50 **BANDS:** 3, .55-21 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 7, 78 rf, 6A7 conv, 78 if. 75 det/avc/af1, 78 bfo, 42 af out, 80 rect **ANT IN:** Unbal, high Z **AF OUT:** 7,000 Ω ext spkr/phones, 4 W **REMARKS:** Internal speaker. Similar to S-8A. Appears identical to Montgomery-Ward Model 37.

**MODEL:** S-8/S-8A **YRS:** 1935 **PRICE:** $49.50 **BANDS:** 3. .54-17 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 7 **REMARKS:** Airplane dial, similar to Super-7 (q.v.), probably built by RCA or Howard, internal speaker.

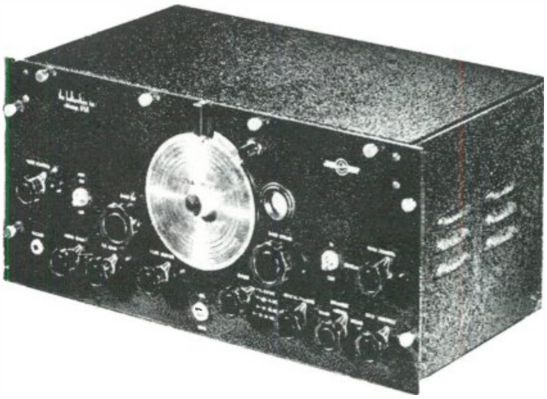


**MODEL:** S/SX-9 Super Skyrider **YRS:** 1935-36 **PRICE:** $79.50, $89.50 w/xtal **BANDS:** 5, .54-41 mHz **IF:** 465 kHz **FILTER:** "S" none, "SX" xtal **TUBES:** 9, 6K7 rf, 6L7 mix, 6C5 hfo, 6K7 if, 6H6 det/avc, 6K7 bfo, 6F5 af1, 6F6 af out, 5Z4 rect **ANT IN:** 2 screw term **AF OUT:** 7,000 Ω ext spkr/phones, 3.5 W **REMARKS:** Internal speaker, first use of metal tubes and first iron core IF transformers.

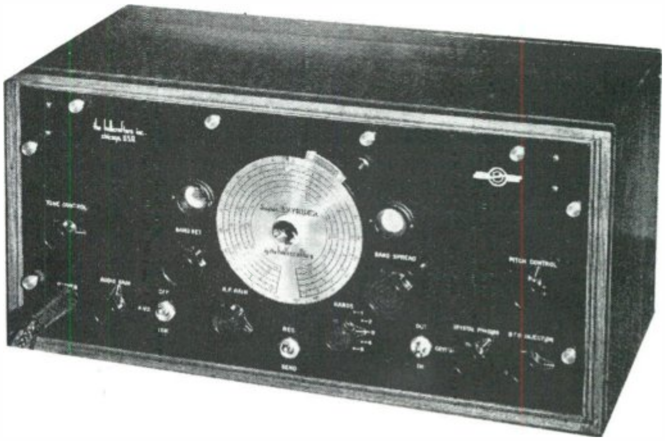




**MODEL:** 5-T Sky-Buddy **YRS:** 1936 **PRICE:** $29.50 **BANDS:** 3, .55-16 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 5, 6A7 conv. 6F7 if/bfo, 75 det/avc/af1, 42 af out, 80 rect **ANT IN:** 3 wires, bal/unbal **REMARKS:** Internal speaker. Note two different dials.

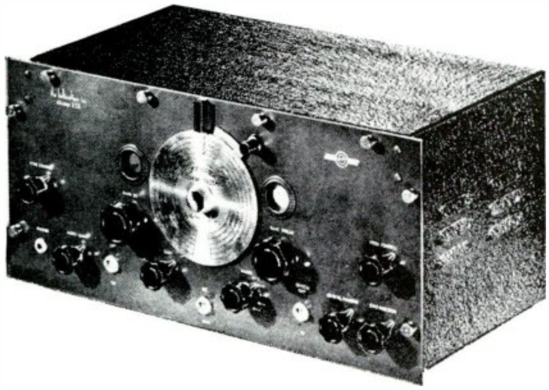


**MODEL:** S/SX-10, Ultra-Skyrider **YRS:** 1936 **PRICE:** $99.50, $114.50 w/xtal **BANDS:** 4, 5.5-79 mHz **IF:** 1600 kHz **FILTER:** xtal "X" version only **TUBES:** 10, 6K7 rf, 6L7 mix, 6C5 hfo, 6K7 if1, 6L7 if2, 6R7 det/avc/bfo, 6J7 noise amp, 6Q7 noise rect/af1, 6F6 af out, 5Z4 rect **ANT IN:** Bal **AF OUT:** 500/5000 Ω, 3.5 W. **REMARKS:** Less than 200 made.

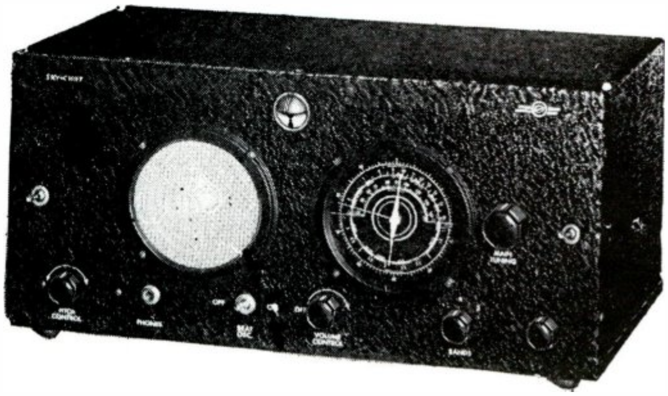


## HALLICRAFTERS

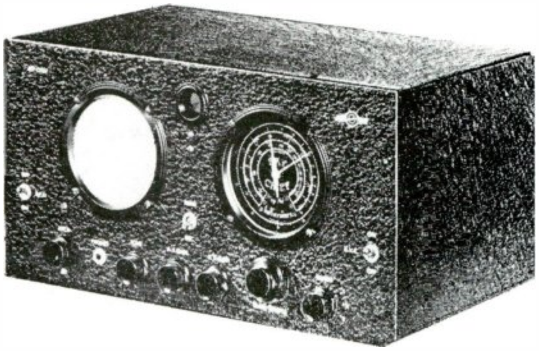
**MODEL:** S/SX-11 Super Skyrider **YRS:** 1936-37 **PRICE:** $89.50, $99.50 with xtal **BANDS:** 5, .535-40 mHz **IF:** 465 kHz **FILTER:** Xtal in "X" version **TUBES:** 11, 6K7 rf, 6L7 mix, 6C5 hfo, 2 6K7 if, 6R7 det/avc/af1, 6K7 bfo, 6G5 tun eye, 2 6L6 p/p af out, 5Z3 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 500/5000 Ω, 14 W. **REMARKS:** Magic eye tuning indicator, first Super Skyrider with separate speaker. Shown in optional mahogany cabinet.



**MODEL:** S/SX-12 Skyrider Commercial **YRS:** 1936 **PRICE:** $99.50, $114.50 with xtal **BANDS:** 5, 0.1-11.5 mHz **IF:** 1600 kHz **FILTER:** Xtal in "X" version **TUBES:** 11, 6K7 rf, 6L7 mix, 6C5 hfo, 2 6K7 if, 6R7 det/avc/af1, 6K7 bfo, 6G5 tun eye, 2 6L6 p/p af out, 5Z3 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 500/5000 Ω, 14 W. **REMARKS:** Same as SX-11 except tuning range and IF.

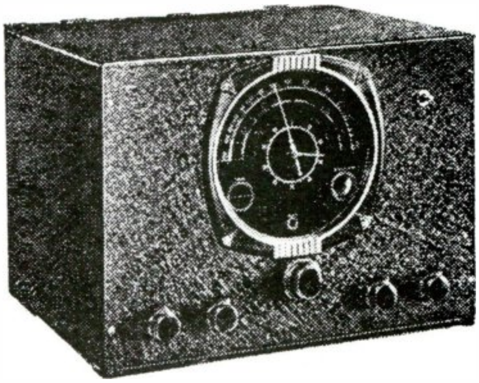


## HALLICRAFTERS



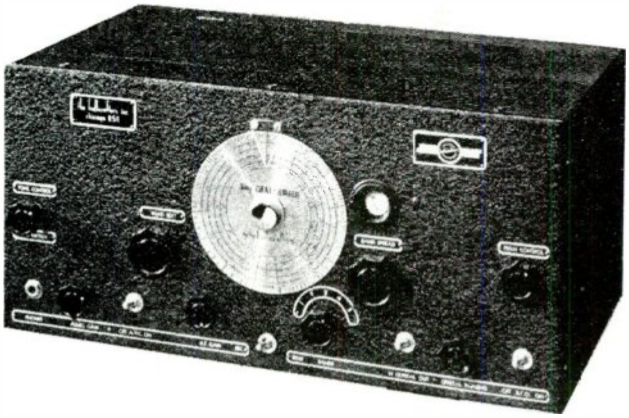
**MODEL:** S-14 Sky Chief **YRS:** 1936 **PRICE:** $44.50 **BANDS:** 3, .54-17.6 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 7, 78 rf, 6A7 conv, 6F7 if/bfo, 75 det/avc/af1, 42 af out, 6G5 tun eye, 80 rect **REMARKS:** Internal speaker, tuning eye. Note two different panel layouts.

**MODEL:** S-14 Sky Chief (Variation) **REMARKS:** 6D6 rf (vs 78), 6B5 af out (vs 42).

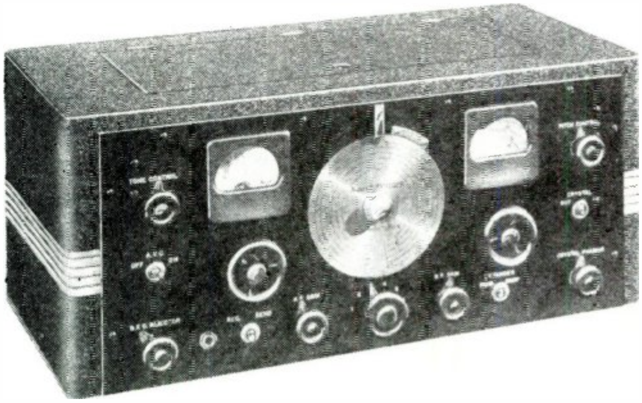


**MODEL:** Sky Master **YRS:** 1937 **BANDS:** 3, .53-17 mHz **IF:** 465 kHz **TUBES:** 8 **AF OUT:** Low level for phones or power amp. **REMARKS:** Tuner for amateur or BC use. Ad says, "For use with Headphones or Amplifier and Speaker." This is different than unit in Dachis which has audio output tube and speaker terminals.

## HALLICRAFTERS

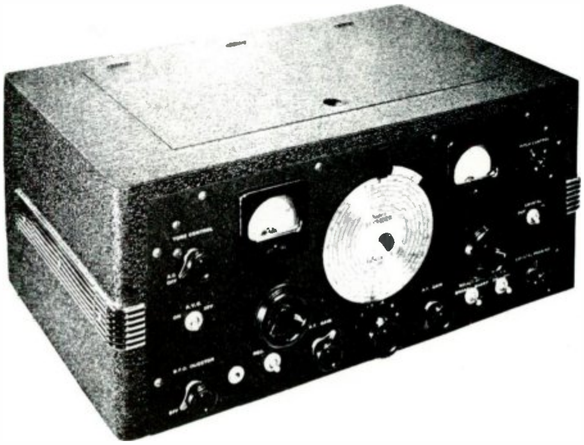


**MODEL:** S/SX-15 Sky Challenger **YRS:** 1937 **PRICE:** $69.50, $81.95 w/xtal **BANDS:** 5, .535-38 mHz **IF:** 465 kHz **FILTER:** xtal "X" version only **TUBES:** 9, 6K7 rf, 6L7 mix, 6C5 hfo, 2 6K7 if, 6Q7 det/avc/af1, 6K7 bfo, 6F6G af out, 80 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 500/5000 Ω, 4 W.



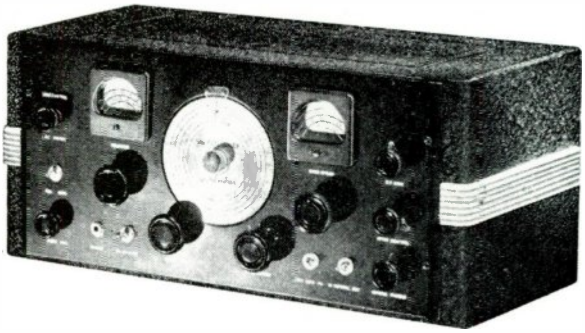
**MODEL:** S/SX-16 Super Skyrider **YRS:** 1937-38 **PRICE:** $99.00, $111.00 w/xtal **BANDS:** 6, .55-60 mHz **IF:** 465 kHz **FILTER:** xtal, "X" version only **TUBES:** 11, 6K7 rf, 6L7 mix, 6J5 hfo, 2 6K7 if, 6R7 det/avc/af1, 6J7 bfo, 6J7 meter amp, 2 6V6 p/p af out, 5Z3 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 500/5000 Ω, 13 W.

## HALLICRAFTERS



**MODEL:** S/SX-17 Super Skyrider **YRS:** 1938-39 **PRICE:** $125.50, $137.50 w/xtal **BANDS:** 6, .54-62 mHz **IF:** 465 kHz **FILTER:** xtal "X" version only **TUBES:** 13, 2 6K7 rf, 6L7 mix, 6J5 hfo, 2 6K7 if, 6R7 det/avc/af1, 6J7 meter amp, 6J7 bfo, 6J5 nl, 2 6V6 p/p af out, 5Z3 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 500/5000 Ω, 13 W. **REMARKS:** Same as SX-16 except adds noise limiter and additional rf amplifier stage.

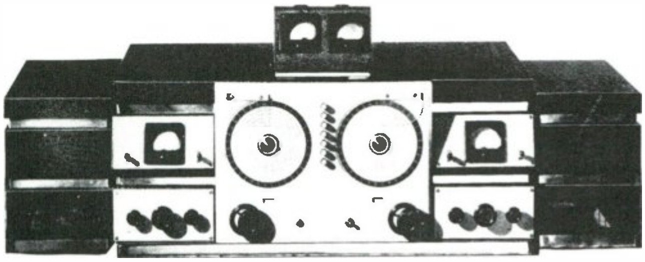
**MODEL:** SX-17F **YRS:** 1937 **PRICE:** $137.50 **TUBES:** 12 **REMARKS:** Same as SX-17 except single ended AF output, "S" meter adjust replaces NL switch, AC/battery switch replaces phone jack, operates from 115 VAC or external vibrator power supply. Built special for FCC.



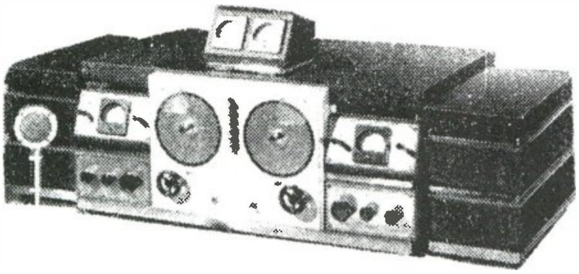
**MODEL:** S/SX-18 Sky Challenger II **YRS:** 1938 **PRICE:** $77.00, $89.00 w/xtal **BANDS:** 5, .54-38 mHz **IF:** 465 kHz **FILTER:** xtal "X" version only **TUBES:** 9, 6K7 rf, 6L7 mix, 6J5 hfo, 2 6K7 if, 6Q7 det/avc/af1, 6J7 bfo, 6F6 af out, 80 rect

## HALLICRAFTERS

**ANT IN:** 3 screw term, A1, A2, G **AF OUT:** 500/5000 Ω, 3.5 W. **REMARKS:** Infinite image rejection circuit on bands 4 & 5, recessed main dial. Socket on rear apron for optional "S" meter.

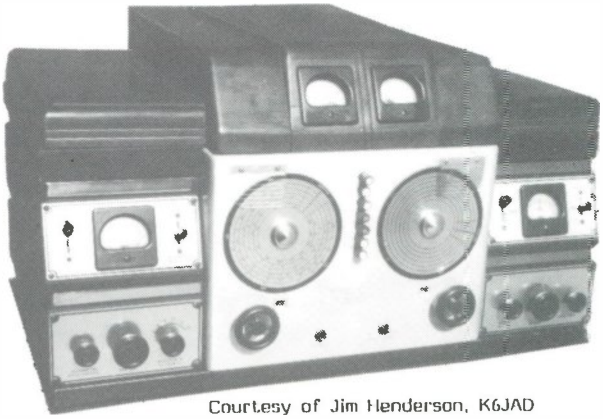


**MODEL:** DD-1 Skyrider Diversity (Prototype) **YRS:** 1938 **BANDS:** 6, 545-62 mHz **IF:** 465 kHz **FILTER:** Tunable notch filters (infinite IF Rejection System) **TUBES:** 25, 4 1851 rf, 2 6L7 mix, 6K6 hfo, 2 6K7 if, 2 6L7 if, 6J5 heterotone osc, 2 6H6 det/avc, 2 6H6 nl, 6J7 "S" meter amp, 2 6J7 div meter amp, 2 6J5 af1/af2, 2 2A3 p/p af out, 2 5Z3 rect **ANT IN:** 3 screw term, A1, A2, G **AF OUT:** 500/5000 Ω, 10 W. **REMARKS:** Separate power supply and audio chassis. This is the receiver pictured in all Hallicrafter ads for the DD-1. Note the blank dials.



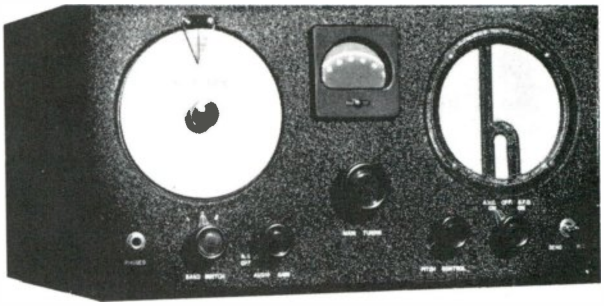
**MODEL:** DD-1 Skyrider Diversity (Production) **YRS:** 1938-40 **PRICE:** $422 **TUBES:** 26, same as DD-1 (Prototype) except added 6J5 bfo **REMARKS:** Same as prototype except added BFO, replaced separate A and B RF gain controls with single RF balance control, added a BFO pitch control and changed the positions of several of the controls. This is the model that was actually delivered. Best estimate is only about 100 made.

## HALLICRAFTERS

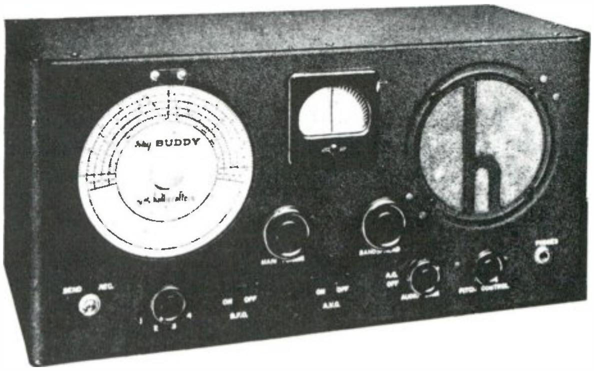


Courtesy of Jim Henderson, K6JAD

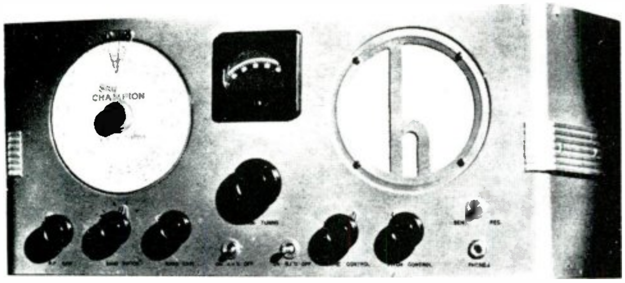
**MODEL:** DD-1 Skyrider Diversity (Variation ) **REMARKS:** Same as production model but with streamlined appendages added to the top of the main tuner unit. They contained nothing but the two diversity meters. Note K6SAD changed the position of the two large knobs on the side panels to conform to the Hallicrafter ads.



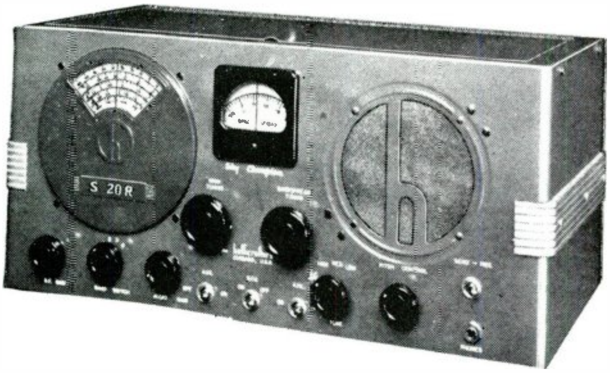
**MODEL:** S-19 Sky Buddy **YRS:** 1938 **PRICE:** $29.50 **BANDS:** 3, .548-18.5 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 5, 6K8 conv, 6P7 if/bfo, 6Q7 det/avc/af1, 6K6 af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G **REMARKS:** Over 10,000 built, internal speaker, single tuning knob, recessed dial. 6L7 if/bfo used on some models. First receiver with the small "h" on the speaker grill.



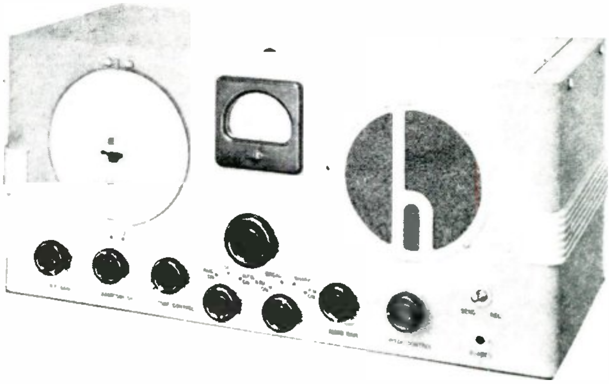
**MODEL:** S-19R Sky Buddy **YRS:** 1939-42 **PRICE:** $29.50 **BANDS:** 4, .545-44 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 6K8 conv, 6SK7 if, 76 bfo, 6SQ7 det/avc/af1, 42(6F6) af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G **REMARKS:** Internal speaker. Added bandspread knob, 10 meter band, separate BFO tube. "Over 12,000 purchased" per *QST* 9/39.



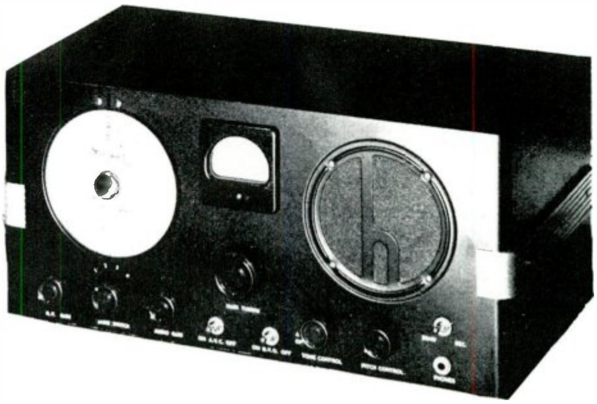
**MODEL:** S-20 Sky Champion **YRS:** 1938-39 **PRICE:** $49.50 **BANDS:** 4, .545-44 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 6K7 rf, 6L7 mix, 6J5 hfo, 6K7 if, 6Q7 det/avc/af1, 6J5 bfo, 6F6 af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G **REMARKS:** Internal speaker, single tuning knob, recessed dial.



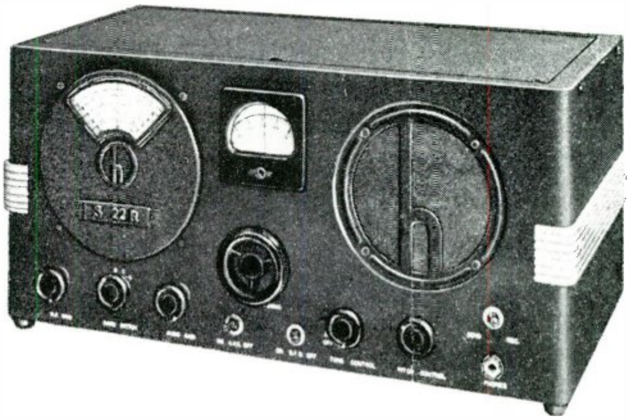
**MODEL:** S-20R Sky Champion **YRS:** 1939-45 **PRICE:** $49.50 **BANDS:** 4, .545-44 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6SK7 rf, 6K8 conv, 2 6SK7 if, 6SQ7 det/avc/af1, 6H6 nl, 6J5 bfo, 6F6 af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G, 400 Ω **AF OUT:** 3 W. **REMARKS:** Internal speaker, covered dial, two tuning knobs, additional IF stage.



**MODEL:** S-21 Skyrider 5-10 **YRS:** 1938-39 **PRICE:** $69.50 **BANDS:** 2, 27-68 mHz **IF:** 1600 kHz **FILTER:** None **TUBES:** 9, 1852 rf, 6L7 mix, 6J5 hfo, 6K7 if, 6P7 if/bfo, 6Q7 det/avc// af1, 6H6 nl, 6F6 af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G **REMARKS:** Internal speaker, single tuning knob.

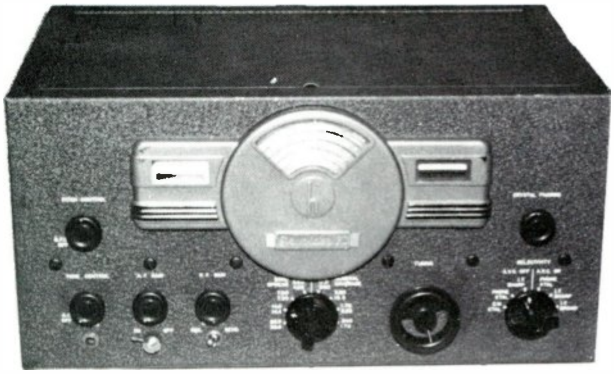


**MODEL:** S-22 Skyrider Marine **YRS:** 1938 **PRICE:** $64.50 **BANDS:** 4, .14-18.5 mHz **IF:** 1600 kHz **FILTER:** None **TUBES:** 8, 6K7 rf, 6L7 mix, 6J5 hfo, 6K7 if, 6Q7 det/avc/af1, 6J5 bfo, 25L6 af out, 25Z5 rect **ANT IN:** 3 screw term, A1, A2, G **REMARKS:** AC/DC, internal speaker.



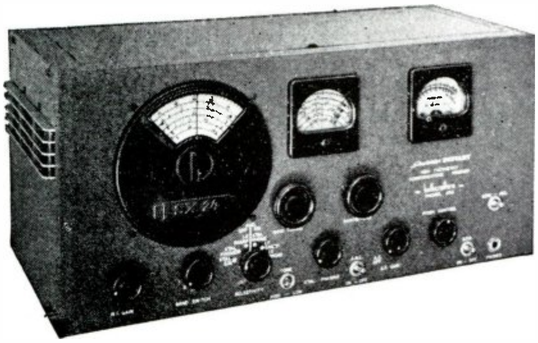
## HALLICRAFTERS

**MODEL:** S-22R Skyrider Marine **YRS:** 1940-46 **PRICE:** $64.50 **BANDS:** 4, .11-18.5 mHz **IF:** 1600 kHz **FILTER:** None**TUBES:** 8, 6SK7 rf, 6K8 conv, 2 6SK7 if, 6SQ7 det/avc/af1, 6J5 bfo, 25L6 af out, 25Z5 rect **ANT IN:** 3 screw term. A1, A2, G, 400 Ω **REMARKS:** Internal speaker, AC/DC, covered dial.



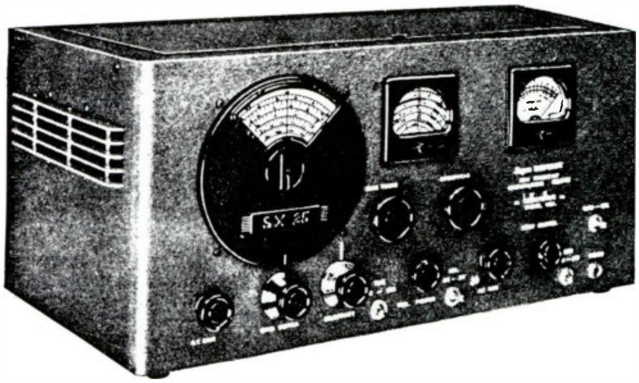
Courtesy SCARS

**MODEL:** SX-23 Skyrider 23 **YRS:** 1939 **PRICE:** $115.50 **BANDS:** 4 GC, .54-34 mHz, 4 ham bands 80, 40, 20, 10 mtrs **IF:** 455 kHz **FILTER:** Xtal **TUBES:** 11, 6SK7 rf, 6SA7 mix, 6SJ7 hfo, 2 6SK7 if, 6SQ7 det/af1, 6B8 avc amp/rect, 6SJ7 bfo, 6H6 nl, 6F6 af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G, 400 Ω **AF OUT:** 500/5000 Ω, 5 W.



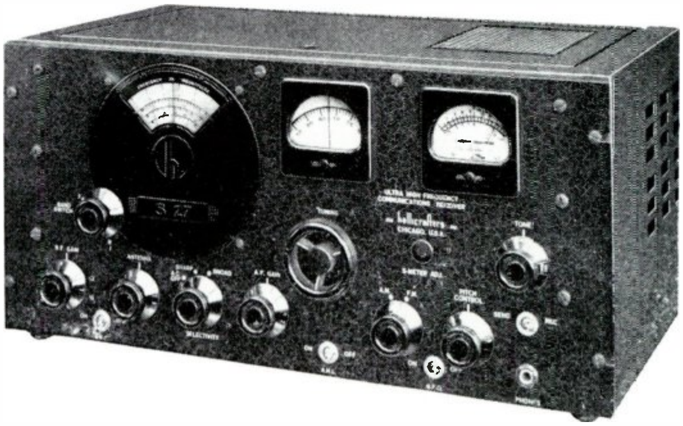
**MODEL:** SX-24 Skyrider Defiant **YRS:** 1939-43 **PRICE:** $69.50 **BANDS:** 4, .54-43 mHz **IF:** 455 kHz **FILTER:** Xtal **TUBES:** 9, 6SK7 rf, 6K8 conv, 2 6SK7 if, 6SQ7 det/avc/af1, 6H6 anl, 76 bfo, 6F6 af out, 80 rect. **ANT IN:** 3 screw term, A1, A2, G, 400 Ω **AF OUT:** 500/5000 Ω, 5 W.

## HALLICRAFTERS



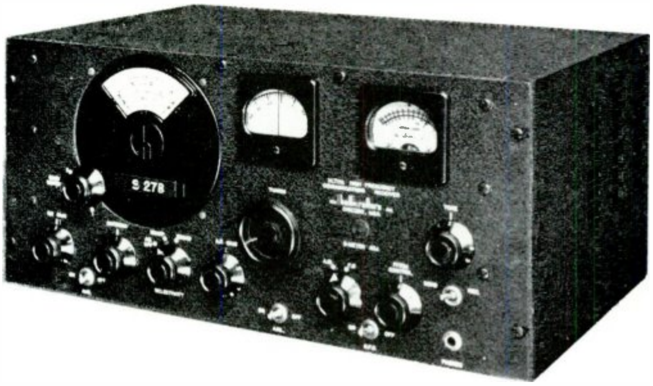
**MODEL:** SX-25 Super Defiant **YRS:** 1940-46 **PRICE:** $99.50 **BANDS:** 4, .54-42 mHz **IF:** 455 kHz **FILTER:** Xtal **TUBES:** 12, 6SK7 rf1, 6SK7 rf2, 6K8 conv, 2 6SK7 if, 6SQ7 det/avc/af1, 6SQ7 phase inv, 6H6 nl, 6J5 bfo, 2 6F6 p/p af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G, 400 Ω **AF OUT:** 500/5000 Ω, 8 W.

**MODEL:** S-26F **YRS:** 1938 **BANDS:** 2, 27-82 mHz **IF:** 1600 kHz **TUBES:** 8 **REMARKS:** Electrically like S-21, custom built for FCC.



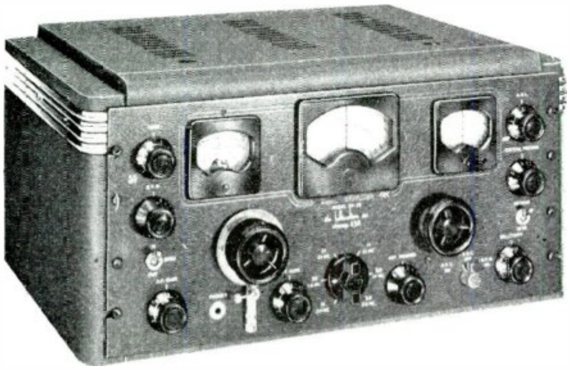
**MODEL:** S-27 **YRS:** 1940-43 **PRICE:** $175.00 **BANDS:** 3, 27-145 mHz **IF:** 5250 kHz **FILTER:** None **TUBES:** 15, 956 rf, 954 mix, 955 hfo, 1852 if1, 1853 if2, 6SK7 if3, 6H6 det/avc, 6J5 bfo, 6C8 phase inv,1852 lim, 6H6 disc, 2 6V6 p/p af out, VR150 vr, 5Z3 rect **ANT IN:** 3 screw term, A1, A2, G **AF OUT:** 500/5000 Ω, 8 W **REMARKS:** AM/FM/CW, variable IF bandwidth.

## HALLICRAFTERS



**MODEL:** S-27B **YRS:** 1940-41 **BANDS:** 3, 36-165 mHz **REMARKS:** Same as S-27 except for frequency coverage.

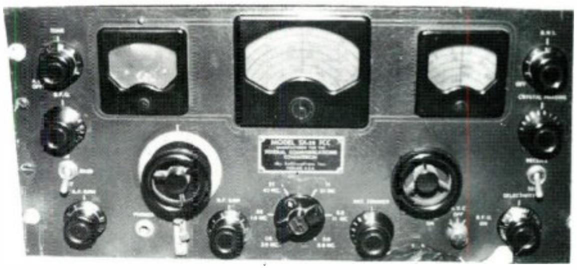
**MODEL:** S-27FCC **YRS:** 1942 **REMARKS:** Special S-27 for FCC.



**MODEL:** SX-28 Super Skyrider **YRS:** 1940-43 **PRICE:** $159.50 **BANDS:** 6, .54-43 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 15, 6AB7 rf1, 6SK7 rf2, 6SA7 mix, 6SA7 hfo, 6L7 if1/nl, 6SK7 if2, 6B8 det/meter amp, 6B8 avc amp, 6AB7 noise amp, 6H6 noise rect, 6J5 bfo, 6SC7 af1, 2 6V6 p/p af out, 5Z3 rect **ANT IN:** 3 screw term, A1, A2, G, 400 Ω **AF OUT:** 500/5000 Ω, 8 W. **REMARKS:** "Over 50,000 built" (probably includes "A" model.)

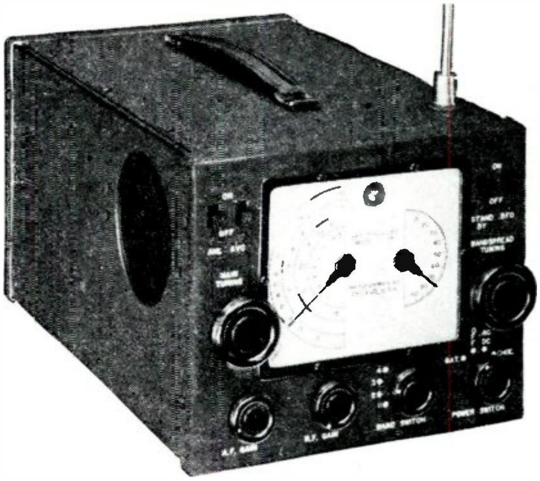
**MODEL:** SX-28A Super Skyrider **YRS:** 1944-46 **PRICE:** $223 **REMARKS:** Same as SX-28 except added permeability tuned, higher Q inductors in front end. The inductors and trimmers for each band were mounted on small, individual chassis for easy removal.

## HALLICRAFTERS

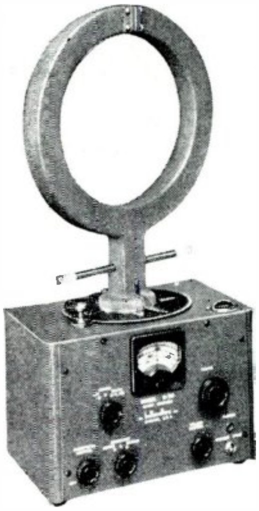


Courtesy John L. Orahood

**MODEL:** SX-28FCC **REMARKS:** Special SX-28 manufactured for FCC. Differences not known.

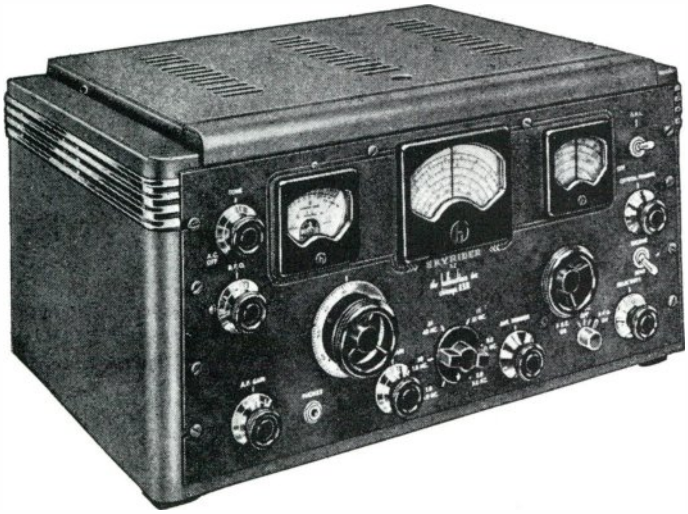


**MODEL:** S-29 Sky Traveler **YRS:** 1940-43 **PRICE:** $59.50 **BANDS:** 4, .55-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 1T4 rf, 1R5 conv, 2 1P5 if, 1H5 det/af1/avc, 1G4 bfo, 1G4 nl, 3Q5 af out, 50Y6 rect **ANT IN:** (1) Whip (2) 4 pin socket, A, D1, D2, G **REMARKS:** Portable, AC/DC, batteries, internal speaker, 10,000 built during WW II.

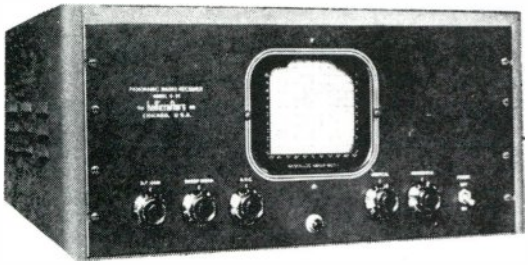


## HALLICRAFTERS

**MODEL:** S-30 Radio Compass **YRS:** 1940-43 **PRICE:** $99.50 **BANDS:** 3, 0.2-3 mHz **IF:** 175 kHz **FILTER:** None **TUBES:** 6, 6SK7 rf, 6K8 conv, 6SK7 if, 6SQ7 det/avc/af1, 6G6 af out, 6U5 tun eye **REMARKS:** Direction finding receiver, separate 6V. vibrapack power supply, external speaker.



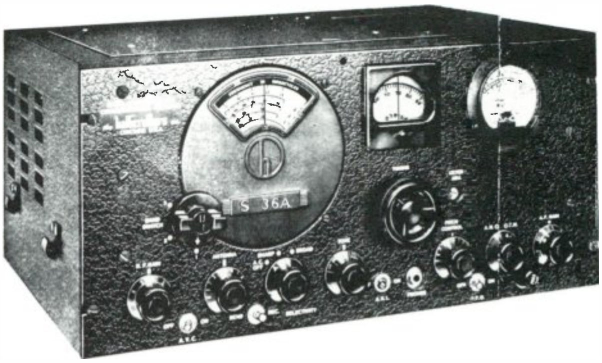
**MODEL:** SX-32 Skyrider **YRS:** 1941-43 **PRICE:** $149.50 **BANDS:** 6, .54-40 mHz **TYPE:** **IF:** 455 kHz **FILTER:** Xtal **TUBES:** 13, 6AB7/1853 rf1, 6SK7 rf2, 6BA7 mix, 6SA7 hfo, 6K7 if1, 6SK7 if2, 6H6 det/nl, 6J5 bfo, 6B8 avc amp/rect, 6SC7 af1, 2 6V6 af out, 5Z3 rect **ANT IN:** 3 screw term, A1, A2, G **AF OUT:** 500/5000 Ω, 8 W



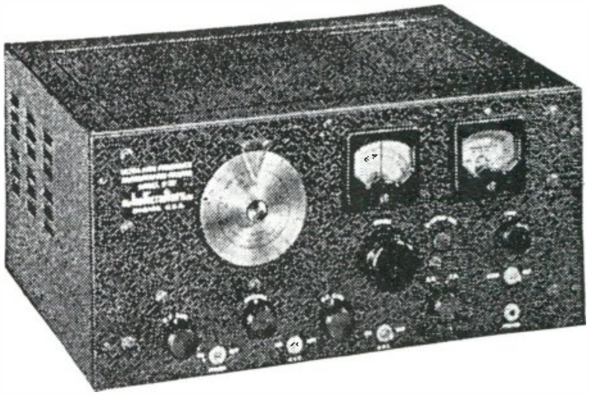
**MODEL:** S-35 Panoramic Receiver **YRS:** 1942-46 **PRICE:** $375.50 **IF:** 455, 100 kHz **TUBES:** 14, 6SG7 if, 6SA7 conv, 6SK7 if, 6SQ7 det/vert amp, 6SN7 sawtooth osc, 6SJ7 blanking, 6AC7 reac mod, 6J5 osc, 6SC7 hor amp, 2X2/879 hv rect, 80 1v rect, VR105 vr, VR150 vr, 5AP1 crt **REMARKS:** 455 kHz input panoramic adaptor.

## HALLICRAFTERS

**MODEL:** S-36 **YRS:** 1942 **PRICE:** $307.50 **BANDS:** 3, 27.8-143 mHz **IF:** 5250 kHz **FILTER:** None **TUBES:** 15 **REMARKS:** Similar to S-27 (q.v.) and APR-5. US Navy RBK-13.

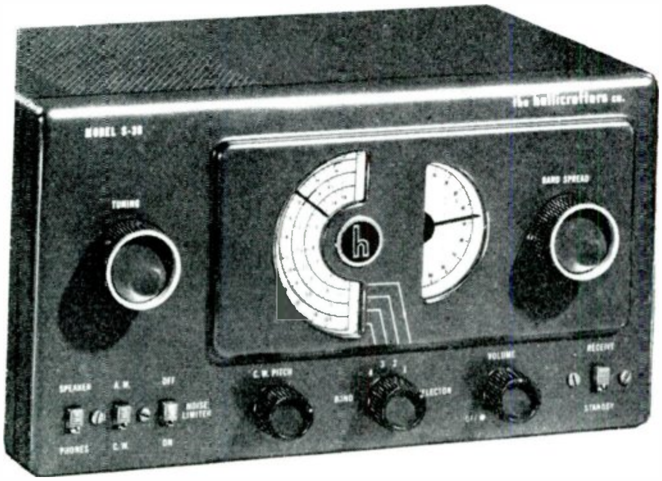


**MODEL:** S-36A **YRS:** 1945-46 **PRICE:** $415.00 **BANDS:** 3, 27.8-143 mHz **IF:** 5250 kHz **FILTER:** None **TUBES:** 15, 956 rf, 954 mix, 955 hfo, 6AC7/1852 if1, 6AB7/1853 if2, 6SK7 if3, 6H6 det/nl, 6AC7/1852 FM lim, 6H6 FM disc, 6SL7 af1, 6J5 bfo, 2 6V6 p/p out, VR150 vr, 5U4 rect **ANT IN:** 3 screw term, A1, A2, G **AF OUT:** 500/5000 Ω, 8 W **REMARKS:** AM/FM/CW, similar to S-27, BC-787. US Navy RBK-16.



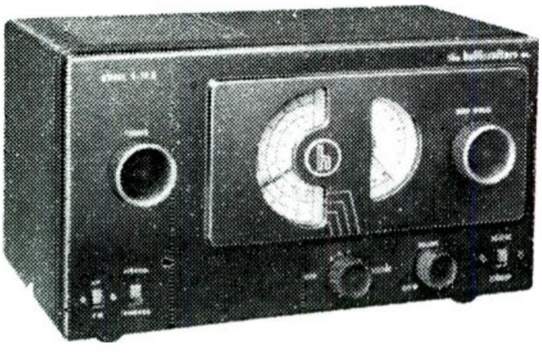
**MODEL:** S-37 **YRS:** 1945-48 **PRICE:** $591.75 **BANDS:** 1, 130-210 mHz **IF:** 18 mHz **FILTER:** None **TUBES:** 14, 2 954 rf, 954 mix, 955 hfo, 6AC7/1852 if1, 6AB7/1853 if2, 6SK7 if3, 6H6 det/nl, 6AC7/1852 FM lim, 6H6 FM disc, 6SC7 af1, 6V6 af out, VR150 vr, 5U4 rect **REMARKS:** AM/FM.

## HALLICRAFTERS



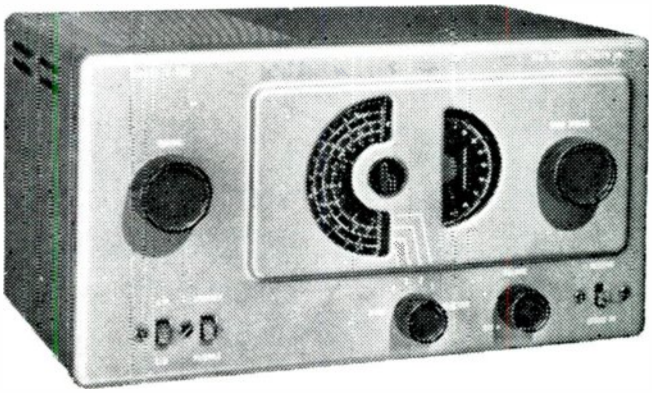
**MODEL:** S-38 **YRS:** 1946 **PRICE:** $39.50 **BANDS:** 4, .54-32 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 12SA7 conv, 12SK7 if, 12SQ7 det/avc/af1, 12SQ7 bfo/nl, 35L6 af out, 35Z5 rect **ANT IN:** 3 screw term, 52-600 Ω, bal/unbal **AF OUT:** 1.6 W. **REMARKS:** AC/DC, internal speaker. Appears to be repackaged Echophone EC-1A. (qv). Replaces S-19R Sky Buddy.

**MODEL:** S-38A **YRS:** 1946-47 **PRICE:** $49.50 **BANDS:** 4, .54-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 5, 12SA7 conv, 12SK7 if/bfo, 12SQ7 det/avc/af1, 50L6 af out, 35Z5 rect **ANT IN:** 3 screw term, 52-600 Ω, bal/unbal **AF OUT:** 1.6 W, 3.2 Ω **REMARKS:** AC/DC, internal speaker. Eliminates "CW pitch" control from front panel which is identical to S-38B. Eliminated BFO tube, used regenerative IF.

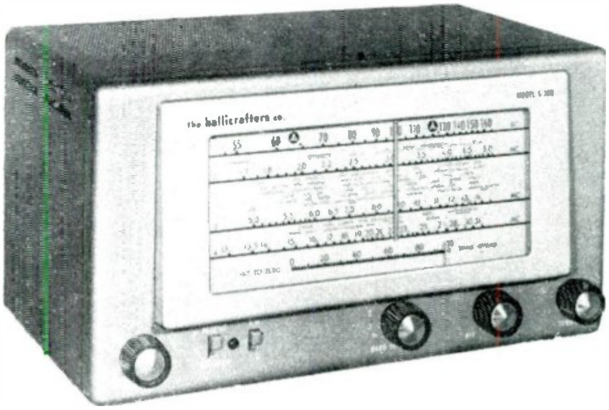


## HALLICRAFTERS

**MODEL:** S-38B **YRS:** 1947-52 **PRICE:** $49.50 **BANDS:** 4, .54-32 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 5, 12SA7 conv, 12SK7 if/bfo, 12SQ7 det/avc, 35L6 af out, 35Z5 rect **ANT IN:** 3 screw term, 52-600 Ω, bal/unbal **AF OUT:** 1.6 W, 3.2 Ω **REMARKS:** AC/DC, internal speaker.

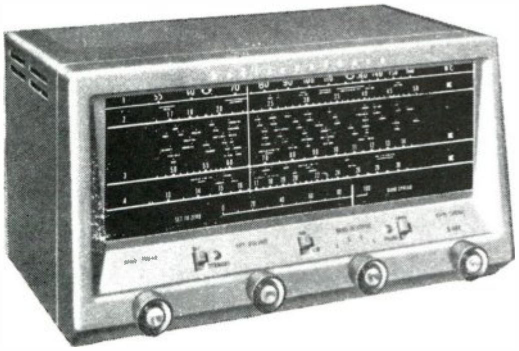


**MODEL:** S-38C **YRS:** 1952-54 **PRICE:** $49.50 **BANDS:** 4, .54-32 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 5, 12SA7 conv, 12SK7 if/bfo, 12SQ7 det/avc, 50L6 af out, 35Z5 rect **ANT IN:** 3 screw term, 52-600 Ω, bal/unbal **AF OUT:** 1.6 W, 3.2 Ω **REMARKS:** AC/DC, internal speaker.



**MODEL:** S-38D **YRS:** 1954-57 **PRICE:** $49.50 **BANDS:** 4, .54-32 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 5, 12SA7 conv, 12SG7 if/bfo, 12SQ7 det/af1, 50L6 af out, 35Z5 rect **ANT IN:** 3 screw term, 52-600 Ω, bal/unbal **AF OUT:** 1 W, 3.2 Ω **REMARKS:** Changed to slide rule dial, AC/DC, internal speaker.

## HALLICRAFTERS

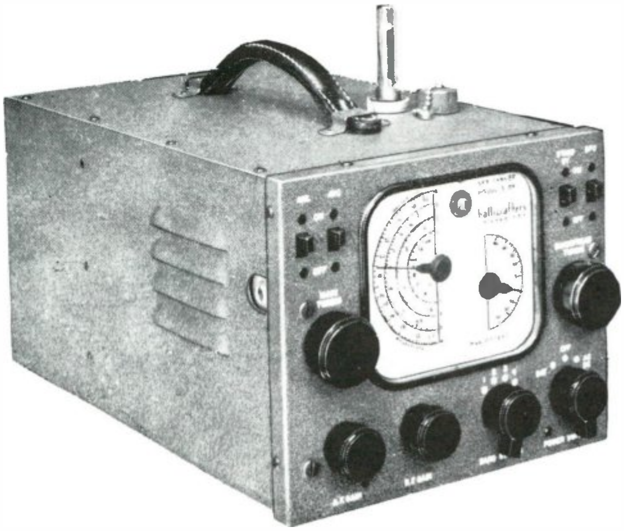


**MODEL:** S-38E **YRS:** 1957-61 **PRICE:** $54.95 **BANDS:** 4, .54-32 mH **IF:** 455 kHz **FILTER:** None **TUBES:** 5, 12BE6 conv, 12BA6 if/bfo, 12AU6 det/af1, 50C5 af out, 35W4 rect **ANT IN:** 3 screw term, 52-600 Ω, bal/unbal **AF OUT:** 1 W, 3.2 Ω **REMARKS:** Changed to miniature tubes, AC/DC, internal speaker.

**MODEL:** S-38EB (sometimes S-38B) **REMARKS:** S-38E in blond cabinet.

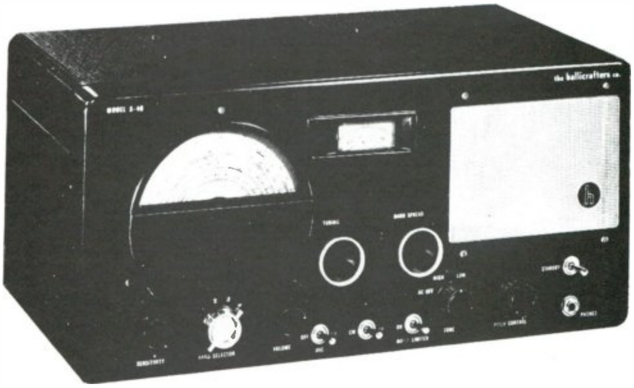
**MODEL:** S-38EM (sometimes S-38M) S-38E in mahogany cabinet.

**MODEL:** SX-38 **YRS:** 1944 **PRICE:** $255 **REMARKS:** Similar to SX-28.

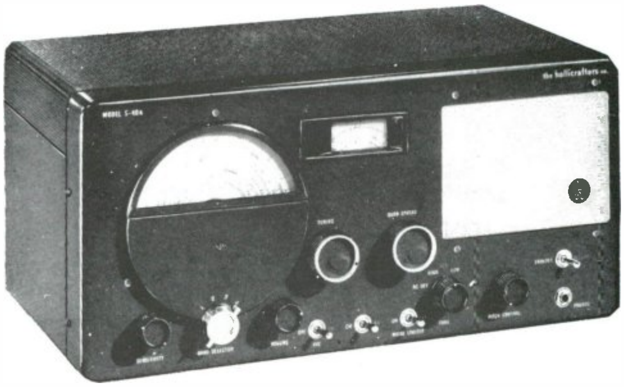


**MODEL:** S-39 Sky Ranger **YRS:** 1945-46 **PRICE:** $110 **BANDS:** 4, .54-30.5 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 1T4 rf, 1R5 conv, 2 1P5 if, 1H5 det/avc/af1, 1H5 bfo/anl, 3Q5 af out, 2 35Z5 rect **ANT IN:** (1) Whip (2) 4 pin socket A, D1, D2, G **REMARKS:** Portable, AC/DC Battery.

## HALLICRAFTERS

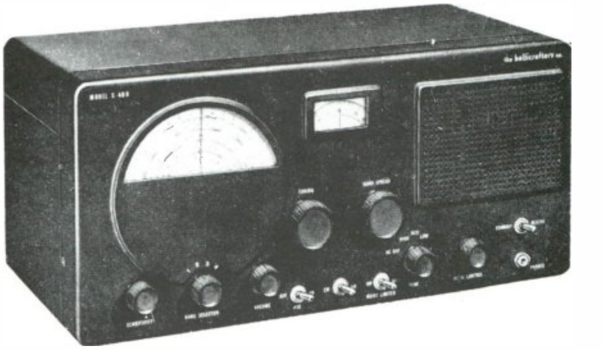


**MODEL:** S-40 **YRS:** 1946-47 **PRICE:** $79.50 **BANDS:** 4, .54-43 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6SG7 rf, 6SA7 conv, 2 6SK7 if, 6SQ7 det/af1, 6H6 avc/anl, 6J5 bfo, 6F6 af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G, 50-600 Ω **AF OUT:** 2.5 W. **REMARKS:** Internal spkr.



**MODEL:** S-40A **YRS:** 1947-49 **PRICE:** $89.50 **BANDS:** 4, .54-43 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6SG7 rf, 6SA7 conv, 2 6SK7 if, 6SQ7 det/af1/avc, 6H6 anl/gas gate, 6J5 bfo, 6F6 af out, 5Y3 rect **ANT IN:** 3 screw term, A1, A2, G, 50-600 Ω **AF OUT:** 2.5 W, 3.2 Ω **REMARKS:** Internal speaker.

**MODEL:** S-40AU **REMARKS:** Same as S-40A except 105-250 V., 25-60 Hz P/S.

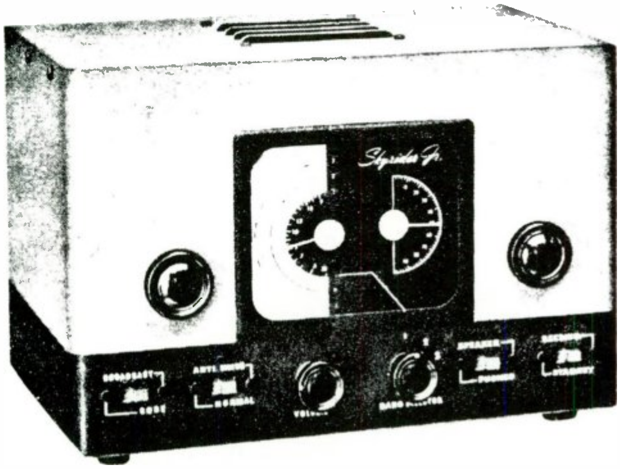


## HALLICRAFTERS

**MODEL:** S-40B **YRS:** 1950-54 **PRICE:** $89.95 ('50), $129.95 ('53) **BANDS:** 4, .54-43 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 6SG7 rf, 6SA7 conv, 2 6SK7 if, 6SL7 bfo/det, 6H6 anl/avc. 6F6 af out, 5Y3 rect **ANT IN:** 3 screw term, A1, A2, G, 50-600 Ω **AF OUT:** 2.5 W, 3.2 Ω **REMARKS:** Internal speaker, "World's most popular ham receiver" per Hallicrafters' ad in 1950.

**MODEL:** S-40BU **REMARKS:** Same as S-40B except 105/250 V., 25/60 Hz power supply.

**MODEL:** S-40B (Variation) **REMARKS:** Same as S-40B except following tubes: 6H6 det/anl/avc, 6SC7 bfo/af1, 6K6 af out.



**MODEL:** S-41 Skyrider, Jr. **YRS:** 1946-47 **PRICE:** $33.50 **BANDS:** 3, .55-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 12SA7 conv, 12SK7 if, 12SQ7 det/avc/af1, 12SQ7 bfo/anl, 35L6 af out, 35Z5 rect **ANT IN:** 3 screw term, A1, A2, G, 330 Ω **AF OUT:** high Z phones **REMARKS:** AC/DC, internal speaker, "sucessor to EC-1."

**MODEL:** S-41G **REMARKS:** S-41 in gray cabinet.

**MODEL:** S-41W **REMARKS:** S-41 in white cabinet.

## HALLICRAFTERS

**MODEL:** SX-42 **YRS:** 1946-48 **PRICE:** $250, $275 ('48) **BANDS:** 6, .54-110 mHz **IF:** 10.7 mHz (FM), 455 kHz (AM) **FILTER:** Crystal **TUBES:** 15, 2 6AG5 rf, 7F8 conv, 6SK7 if1, 6SG7 if2, 6H6 det/nl, 2 7H7 FM limiter, 6H6 FM disc, 6SL7 af inv, 7A4 bfo/FM mtr amp, 2 6V6 p/p af out, VR150 vr, 5U4 rect **ANT IN:** 3 screw term, A1, A2, A3, 300 Ω **AF OUT:** 8 W, 500/5000 Ω **REMARKS:** FM 27-110 mHz, band spread and main tuning knobs are coaxial.

**MODEL:** SX-42U **REMARKS:** SX-42 with 120/240 V. power supply.

**MODEL:** SX-43 **YRS:** 1947-49 **PRICE:** $169.50 **BANDS:** AM 6, .54-55 mHz, FM 2, .44-55, 88-108 mHz **IF:** 455 kHz (AM), 10.7 mHz (FM) **FILTER:** Crystal **TUBES:** 11, 6BA6 rf, 7FB conv, 6SG7 if1, 6SH7 if2/conv2, 6SH7 if3, 6H6 det/nl, 6AL5 FM ratio det, 6SQ7 af1, 6J5 bfo/osc2, 6V6 af out, 5Y3 rect. **ANT IN:** 3 screw term, 72-600 Ω **AF OUT:** 3 W, 500/5000 Ω

SKYRIDER
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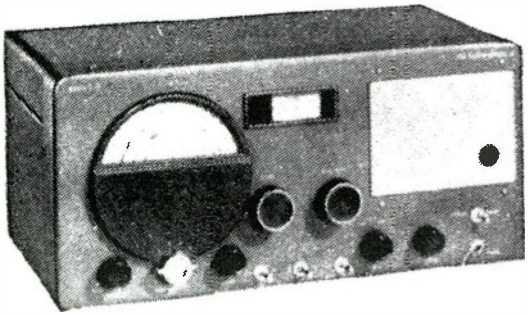
**MODEL:** SP-44 Skyrider Panoramic **YRS:** 1947-48 **PRICE:** $49.50 **IF:** 450-470 kHz **TUBES:** 10 **REMARKS:** Panoramic adaptor.

**MODEL:** S-51 Sea-Farer **YRS:** 1947-49 **PRICE:** $129.95 **BANDS:** 4, .132-13 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 10, 6SS7 rf, 7A8 conv, 2 6SS7 if, 7C6 det/avc/af1, 7A6 nl, 6SS7 bfo, 6V6 af out, 35L6 af out, 35Z5 rect **ANT IN:** 3 screw term, 300 Ω **REMARKS:** AC/DC, internal speaker, also has 3 fixed frequencies.



**MODEL:** S-52 **YRS:** 1948-49 **PRICE:** $99.50 **BANDS:** 4, .54-43 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 6SG7 rf, 6SA7 conv, 2 6SK7 if, 6H6 det/avc, 6SC7 bfo/af1, 25L6 af out, 25Z6 rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 2.5 W **REMARKS:** AC/DC version of S-40A, internal speaker.

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MODEL S-53
BANDSPREAD
STANDBY
BAND SELECTOR
CW
AM
PHONO
SENSITIVITY
NOISE LIMITER
OFF
VOLUME
HIGH
LOW TONE

**MODEL:** S-53 **YRS:** 1948-49 **PRICE:** $79.50 **BANDS:** 5, .54-38, 48-54.5 mHz **IF:** 2075 kHz **FILTER:** None **TUBES:** 8, 6BA6 mix, 6C4 hfo, 2 6BA6 if, 6H6 det/avc/nl, 6SC7 bfo/af1, 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, 50-600Ω **AF OUT:** 2.5 W. **REMARKS:** Internal speaker.

**MODEL:** S-53U **REMARKS:** Same as S-53 except power supply for 110/130/150/220/250 V., 25-60 Hz.

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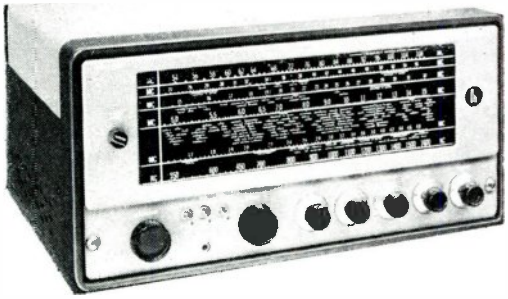
MODEL S-53A
BANDSPREAD

**MODEL:** S-53A **YRS:** 1950-59 **PRICE:** $79.95 **BANDS:** 5, .54-54.5 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 6BA6 mix, 6C4 hfo, 2 6BA6 if, 6H6 anl/avc/det, 6SC7 bfo/af1, 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, A1, A2. G **AF OUT:** 1 W. **REMARKS:** Internal speaker. NB: IF freq. changed

## HALLICRAFTERS

**MODEL:** S-53AU **REMARKS:** Same as S-53A except power supply for 110/130/150/220/250 V., 25-60 kHz.

**MODEL:** Globemaster SX-62 **YRS:** 1948-51 **PRICE:** $269.50 **BANDS:** 6, .54-109 mHz **IF:** 455 kHz, except 10.7 mHz bands 5 & 6 (27-109 mHz) **FILTER:** Crystal **TUBES:** 16, 2 6AG5 rf, 7F8 conv, 6SK7 if1, 6SG7 if2, 7H7 if3, 7H7 FM lim/det, 6H6 FM det, 7A4 bfo, 6H6 nl, 6SL7 af1, 6C4 calib, 2 6V6 p/p af out, VR150 vr, 5U4 rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 10 W, 500/5000 Ω **REMARKS:** FM 27-109 mHz.



**MODEL:** SX-62A **YRS:** 1955-63 **PRICE:** $350 **BANDS:** 6, .55-109 mHz **IF:** 455 kHz bands 1-4, 10.7 mHz bands 5 & 6 (27-109 mHz) **FILTER:** Crystal **TUBES:** 16, 2 6AG5 rf, 7F8 conv, 6SK7 if1, 6SG7 if2, 6SG7 lim/det, 6H6 FM det, 6J5 bfo, 6H6 nl, 2 6SL7 phase inv, 2 6V6 p/p af out, 6C4 calib, VR150 vr, 5U4 rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 10 W, 3.2/8/500 Ω **REMARKS:** AM/FM bands 5,6(27-109 mHz). NB: Different output Z and tube types.

**MODEL:** SX-62B **YRS:** 1965 **PRICE:** $525 **TUBES:** 14 **REMARKS:** Differences not known.

**MODEL:** SX-62U **PRICE:** $279.50 **REMARKS:** Same as SX-62 except power supply for 105-250 V., 25-100 Hz.

## HALLICRAFTERS

**MODEL:** SX-71 **YRS:** 1949-55 **PRICE:** $179.50 ('49), $249.95 ('55) **BANDS:** 5, .538-35, 46-56 mHz **TYPE:** Double conversion, tunable hfo **IF:** 2075, 455 kHz **FILTER:** Crystal **TUBES:** 13, 6BA6 rf, 6AU6 mix1, 6C4 hfo, 6BE6 mix2/xco, 3 6SK7 if, 6AL5 det, 6H6 avc/anl, 6SC7 af1/bfo, 6K6 af out, VR150 vr, 5Y3 rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 3.2/500 Ω, 3 W.

**MODEL:** SX-71U **REMARKS:** Same as SX-71 except power supply for 105-250 V., 25-100 Hz.

**MODEL:** S-72 **YRS:** 1949-51 **PRICE:** $79.95 **BANDS:** 4, .54-31 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8 + rect, 1T4 rf, 1U4 mix, 1R5 hfo, 2 1U4 if, 1U5 det/af1, 1U5 bfo, 3V4 af out, sel rect **ANT IN:** (1) Loop, (2) whip, (3) term unbal **REMARKS:** AC/DC battery portable, internal speaker.

**MODEL:** S-72L **YRS:** 1950-52 **PRICE:** $99.95 **BANDS:** 4, .175-.4, .54-13 mHz **REMARKS:** Long wave version of S-72.

**MODEL:** SX-73 **YRS:** 1952-53 **PRICE:** $975 **BANDS:** 6, .54-54 mHz **TYPE:** Double Conversion, tunable hfo 7-54 mHz, single conversion .54-7 mHz **IF:** 6000, 455 kHz **FILTER:** Crystal **TUBES:** 20, 6AG5 rf1, 6BA6 rf2, 6BE6 mix1, 6C4 hfo, 6BE6 mix2, 6BA6 xco, 4 6BA6 if, 6AL5 det, 6AT6 af1, 6AL5 avc/anl, 6BA6 bfo, 6Y6 af out, 6AG5 xtal cal, 6BA6 if out, VR150 vr, 5U4 rect, cur reg ballast **ANT IN:** 50-200 Ω, bal/unbal **AF OUT:** 2 W, 500 Ω **REMARKS:** Military R274/FRR, similar to SP600. Turret coil selector.

**MODEL:** SX-73 (Prototype) **YRS:** 1951 **BANDS:** 6, .54-54 mHz **TYPE:** Double conversion, tunable hfo 7-54 mHz, single conversion .54-7 mHz **IF:** 6000, 455 kHz **FILTER:** Crystal **TUBES:** 19 + ballast **REMARKS:** Provision for 6 crystal controlled channels.

**MODEL:** S-76 **YRS:** 1951-54 **PRICE:** $169.50 ('51), $199.95 ('53) **BANDS:** 4, .538-32 mHz **TYPE:** Double conversion, tunable HFO **IF:** 1650, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 11, 6CB6 rf, 6AU6 mix, 6C4 hfo, 6BA6 if1, 6BE6 conv, 6BA6 if2, 6AL5 det/anl, 6SC7 bfo, 6K6 af out, VR150 vr, 5Y3 rect **ANT IN:** 3 screw term, 300 Ω **AF OUT:** 3 W, 3.2/500 Ω **REMARKS:** First of a line of double conversion receivers using the 50 kHz L/C filter system.

**MODEL:** S-76U **REMARKS:** S-76 with universal 105-250 V., 25-60 Hz power supply.

**MODEL:** S-77 **YRS:** 1950-51 **PRICE:** $99.50 **BANDS:** 4, .54-43 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 6SG7 rf, 6SA7 conv, 2 6SK7 if, 6H6 det/anl, 6SC7 af1/bfo, 25L6 af out, 25Z6 rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 2.5 W, 3.2 Ω **REMARKS:** AC/DC version of S-40B, Internal 5" speaker.

**MODEL:** S-77A **YRS:** 1953 **PRICE:** $119.95 **REMARKS:** S-77 with minor electrical changes.

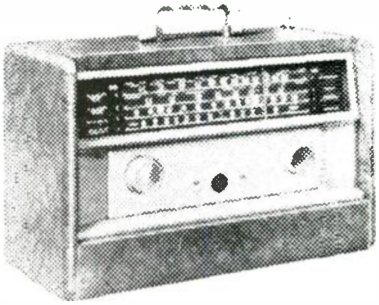
**MODEL:** S-85 **YRS:** 1954-59 **PRICE:** $119.95 **BANDS:** 4, .54-34 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 6SG7 rf, 6SA7 conv, 2 6SK7 if, 6SC7 bfo/af1, 6H6 nl/avc/det, 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, A1, A2, G, 52-600 Ω **AF OUT:** 2 W. **REMARKS:** Successor to S-40B - note same tubes. Internal 5" speaker.

**MODEL:** S-85U **REMARKS:** S-85 with universal 105-250 V., 25-60 Hz power supply.

**MODEL:** S-86 **YRS:** 1954-57 **PRICE:** $119.95 **BANDS:** 4, .54-34 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8 + ballast, 6SG7 rf, 6SA7 conv, 2 6SK7 if, 6H6 nl/avc/det, 6SC7 bfo/af1, 25L6 af out, 5Y3 rect, ballast **ANT IN:** 3 screw term, A1, A2, G, 50-600 Ω **AF OUT:** 2 W. **REMARKS:** AC/DC version of S-85. Internal 5" speaker.

**MODEL:** SX-88 **YRS:** 1954 **PRICE:** $595 **BANDS:** 6, .535-33 mHz **TYPE:** Double conversion, tunable HFO **IF:** 2075, 50 kHz except band 2, 1550, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 20, 6CB6 rf1, 6BA6 rf2, 6U8 mix1/hfo, 6BA6 mix2, 12AX7 xco, 3 6BA6 if, 6AL5 det/nl, 12AX7 af1/phase inv, 6C4 bfo, 6BA6 bfo buff, 6CB6 avc amp, 12AU7 avc rect/k fol, 2 6V6 p/p af out, 6BA6 calib, 4H4 cur reg, 0D3 vr, 5U4 rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 10 W, 3.2/8/500 Ω

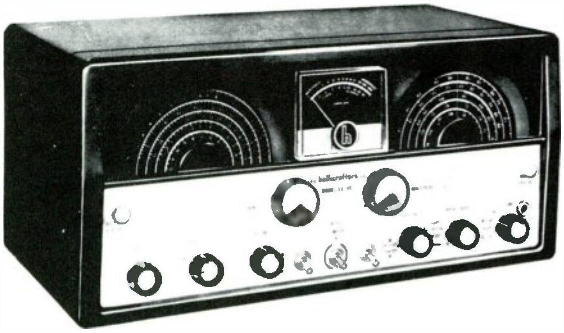
**MODEL:** SX-88U **REMARKS:** SX-88 with universal 100-250 V. 25-60 Hz power supply.



**MODEL:** S-93 **YRS:** 1954-55 **PRICE:** $99.95 **BANDS:** 4, .17-.4, .54-18 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6 + sel rect, 1U4 rf, 1L6 conv, 1U4 if, 1U5 det/avc/af1, 1U5 bfo, 3V4 af out, sel rect **ANT IN:** (1) Loop (2) Whip **REMARKS:** AC/DC Battery portable.

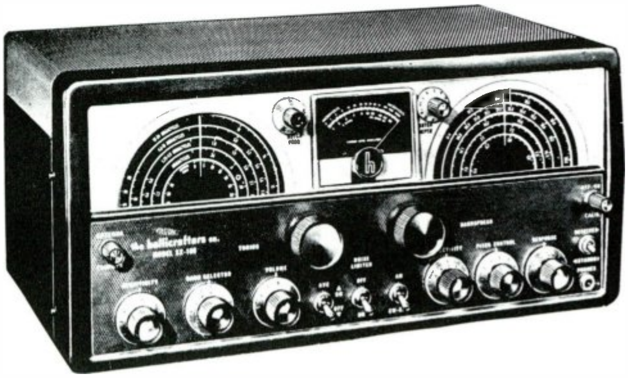
**MODEL:** SX-96 **YRS:** 1954-56 **PRICE:** $249.95 **BANDS:** 4, .538-34 mHz **TYPE:** Double conversion, tunable HFO **IF:** 1650, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 12, 6CB6 rf, 6AU6 mix1, 6C4 hfo, 6AB6 if1, 6BA6 mix2, 12AT7 xco, 6BA6 if2, 6BJ7 det/avc/ anl, 6SC7 bfo/af1, 6K6 af out, VR150 vr, 5Y3 rect **ANT IN:** 3 screw term, 300 Ω bal/unbal **AF OUT:** 1.5 W, 3.2/500 Ω

## HALLICRAFTERS



**MODEL:** SX-99 **YRS:** 1954-58 **PRICE:** $199.95 **BANDS:** 4, .54-34 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 8, 6SG7 rf, 6SA7 conv, 6SG7 if1, 6SK7 if2, 6H6 det/nl/avc, 6SC7 af1/bfo, 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, 52-600 Ω **AF OUT:** 2 W, 3.2/500 Ω.

**MODEL:** SX-99U **REMARKS:** SX-99 with universal 100-250 V., 25-60 Hz power supply.

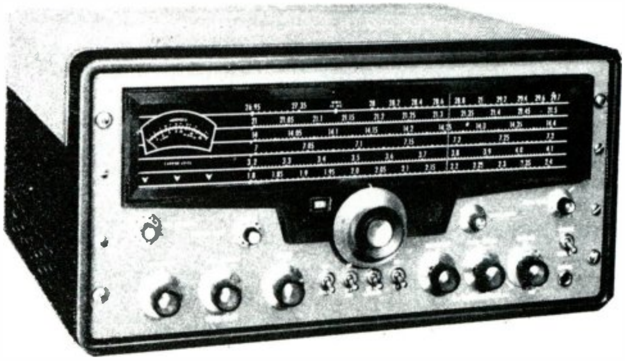


**MODEL:** SX-100 **YRS:** 1955-61 **PRICE:** $295 **BANDS:** 4, .54-34 mHz **TYPE:** Double conversion, tunable hfo **IF:** 1650, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 14, 6CB6 rf, 6AU6 mix1, 6C4 hfo, 6BA6 mix2, 6BA6 if1, 12AT7 xco, 6C4 if2, 6BA6 if3, 6BJ7 det/avc/nl, 6SC7 af1/bfo, 6K6 af out, 6AU6 calib, OA2 vr, 5Y3 rect **ANT IN:** 3 screw term, A1, A2, G, 52-600 Ω **AF OUT:** 1.5 W, 3.2/500 Ω.

**MODEL:** SX-100 MK1A **IF:** 1650, 50.5 kHz **REMARKS:** Other differences not known.

**MODEL:** SX-100 MK2 **IF:** 1650, 50.75 kHz **REMARKS:** Other differences not known.

## HALLICRAFTERS

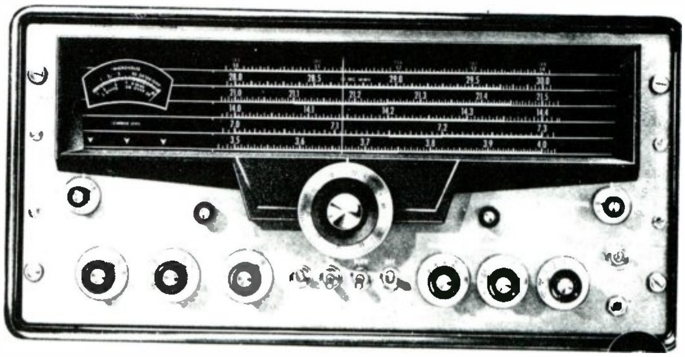


**MODEL:** SX-101 **YRS:** 1956-58 **PRICE:** $395 **BANDS:** 7 ham bands, 160-10 mtrs **TYPE:** Double conversion, tunable hfo **IF:** 1650, 50 kHz **FILTER:** 50.5 kHz L/C **TUBES:** 15, 6CB6 rf, 6BY6 mix1, 12AU7 hfo/buff, 6BA6 if1, 6BA6 mix2, 12AT7 xco, 6C4 if2, 6BA6 if3, 6BJ7 det/nl/avc, 6SC7 af1/bfo, 6BA6 mtr amp, 6K6 af out, 6AU6 calib, OA2 vr, 5Y3 rect **ANT IN:** SO239, 3 screw term, 50-600 Ω **AF OUT:** 1.5 W, 3.2/500 Ω **REMARKS:** Ad says, "...built like a battleship. Bigger. Heavier."

**MODEL:** SX-101 MK II **REMARKS:** Improved stability over SX-101. Other differences not known.

**MODEL:** SX-101 MK III **YRS:** 1958 **REMARKS:** Oscillator filament always on.

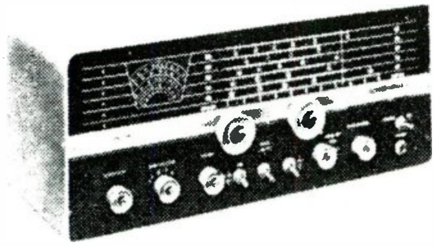
**MODEL:** SX-101 MK IIIA **YRS:** 1959 **PRICE:** $399.50 **BANDS:** 7, 80-10 mtrs + 30.5-34.5 converter band **TYPE:** Double conversion, tunable hfo **IF:** 1650, 50 kHz **FILTER:** 50.5 kHz L/C **TUBES:** 15, 6CB6 rf, 6BY6 mix1, 12BY7 hfo, 6BA6 if1, 6BA6 mix2, 12AT7 xco, 6C4 if2, 6BA6 if3, 6BJ7 det/anl/avc, 6SC7 bfo/af1, 6K6 af out, 6AU6 calib, 6BA6 mtr amp, OA2 vr, 5Y3 rect **ANT IN:** 3 screw term, SO239, 50-600 Ω **AF OUT:** 1.5 W, 3.2/500 Ω **REMARKS:** 160 meter band replaced with converter band.



## HALLICRAFTERS

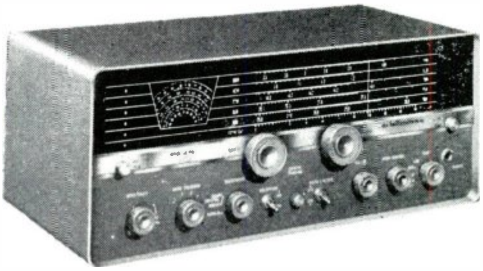
**MODEL:** SX-101A **YRS:** 1959-62 **PRICE:** $399.50 **BANDS:** 7, 80-10 mtrs + 30.5-34.5 mHz converter band **TYPE:** Double conversion, tunable hfo **IF:** 1650, 50.75 kHz **FILTER:** 50.75 kHz L/C **TUBES:** 15, 6DC6 rf, 6BY6 mix1, 12BY7A hfo, 6BA6 if1, 6BA6 mix2, 12AT7 xco, 6DC6 if2, 6BJ7 det/anl,avc, 6BY6 prod det, 6SC7 af1/bfo, 6K6 af out, 6BA6 mtr amp, 6AU6 calib, OA2 vr, 5Y3 rect **ANT IN:** 3 screw term, SO239, 50-600 Ω **AF OUT:** 1.5 W, 3.2/500 Ω **REMARKS:** Changes from SX-101 - new prod detector, 2 position avc, full 10 meter bandspread, band to band gain equalization.

**MODEL:** S-107 **YRS:** 1959-61 **PRICE:** $94.95 **BANDS:** 5, .54-34, 48-54.5 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 6BA6 mix, 6C4 hfo, 2 6BA6 if, 6H6 det/avc/anl, 6SC7 bfo/af1, 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 1 W. **REMARKS:** Internal 4" x 6" speaker. Some models have 6AQ5 audio output tube.



**MODEL:** S-108 **YRS:** 1959-62 **PRICE:** $129.95 **BANDS:** 4, .54-34 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 6SG7 rf, 6SA7 conv, 6SG7 if1, 6SK7 if2, 6H6 det/anl/avc, 6SC7 bfo/af1, 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, 52-600 Ω **AF OUT:** 2 W. **REMARKS:** Stripped version of SX-110. Has no "S" meter, antenna trimmer or crystal filter and does have internal speaker.

## HALLICRAFTERS



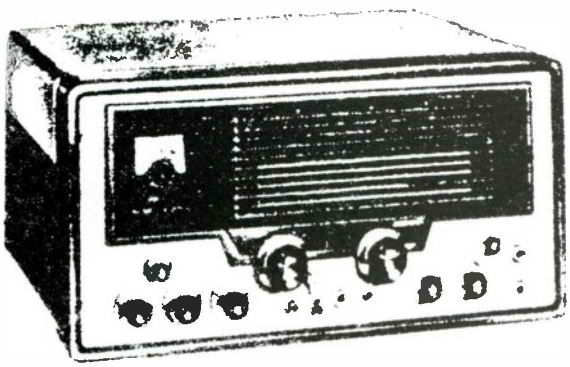
**MODEL:** SX-110 **YRS:** 1959-62 **PRICE:** $159.95 **BANDS:** 4, .54-34 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 8, 6SG7 rf, 6SA7 conv, 6SK7 if2, 6SG7 if1, 6H6 det/anl/avc, 6SC7 bfo/af1, 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, 52-600 Ω **AF OUT:** 2 W, 3.2/500 Ω **REMARKS:** S-108 is stripped version.

**MODEL:** SX-111 (Early version) **YRS:** 1960-61 **PRICE:** $249.50 **BANDS:** 6, WWV + 80-10 mtrs **TYPE:** Double conversion, tunable hfo **IF:** 1650, 50.75 kHz **FILTER:** 50.75 kHz L/C **TUBES:** 12, 6DC6 rf, 6BY6 mix1, 6C4 hfo, 6CB6 if1, 6BA6 mix2, 12AT7 xco, 6DC6 if2, 6BJ7 det/avc/nl, 12AX7 af1/bfo, 6AQ5 af out, OA2 vr, 5Y3 rect. **ANT IN:** Term, phono jack, 50-70 Ω **AF OUT:** 1.5 W, 3.2/500 Ω

**MODEL:** SX-111(Later version) **TUBES:** 13, including 6AU6 calib **REMARKS:** Adds crystal calibrator to original SX-111.

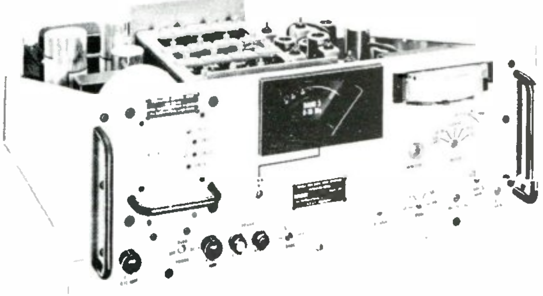
**MODEL:** SX-111 MK1 **YRS:** 1961-62 **PRICE:** $279.50 **BANDS:** **TYPE:** Double conversion, tunable hfo **IF:** 1650, 50.75 kHz **FILTER:** 50.75 kHz L/C **TUBES:** 14, 6DC6 rf, 6BY6 mix1, 6C4 hfo, 6CB6 if1, 6BA6 mix2, 12AT7 xco, 6DC6 if2, 6BJ7 det/avc/nl, 6BY6 prod det, 12AX7 af1/bfo, 6AQ5 af out, 6AU6 calib, OA2 vr, 5Y3 rect **ANT IN:** Term, phono jack, 50-70 Ω **AF OUT:** 1.5 W, 3.2/500 Ω **REMARKS:** Adds product detector to SX-111.

## HALLICRAFTERS



**MODEL:** SX-112 **YRS:** 1961 **PRICE:** $595 **BANDS:** 6, .54-34 mHz **TYPE:** Double conversion, tunable hfo **IF:** 1650, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 14. **ANT IN:** SO239, 50-70 Ω **AF OUT:** 1.5 W, 3.2/500 Ω **REMARKS:** Hallicrafters' last quality general coverage receiver. Never went into production.

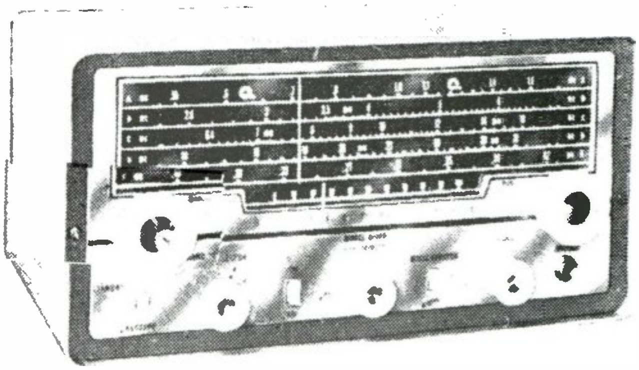
**MODEL:** SX-115 **YRS:** 1961-64 **PRICE:** $595 **BANDS:** 9, 500 kHz bands, WWV + 80-10 mtrs **TYPE:** Fixed HFO, tunable IF, triple conversion **IF:** 6005-6505, 1005, 50.75 kHz **FILTER:** 50.75 kHz L/C **TUBES:** 18 + 5 diodes, 6DC6 rf, 6BA7 mix1, 12AT7 xco, 6DC6 var if, 6BA7 mix2, 6CB6 vfo, 6DC6 if, 6BA6 mix3, 6DC6 if, 12AX7 af1/var bfo, 6BJ7 anl/det/agc2, 6AQ5 af out, 6AU6 agc amp, HD6225 agc1, 2 HD6225 cw/ssb anl, 6AU6 calib, 6AU6 mtr amp, 12AT7 xtal bfo, 6BY6 prod det, 2 Si rect, OA2 vr **ANT IN:** SO239, 50-70 Ω **AF OUT:** 1.5 W, 3.2/500 Ω.



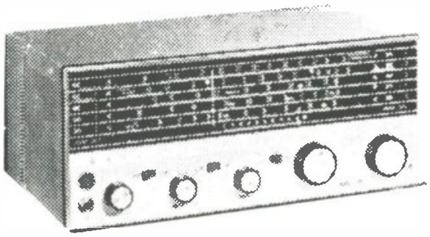
## HALLICRAFTERS

**MODEL:** SX-116 **YRS:** 1961 **BANDS:** 4, 2-30 mHz **IF:** 1650 kHz **FILTER:** Crystal lattice **TUBES:** 20 **ANT IN:** SO239, 50 Ω **AF OUT:** 600 Ω dual line amps, 100 mW **REMARKS:** Military quality crystal controlled SSB strip receiver capable of ISB reception. USAF designation SWE.

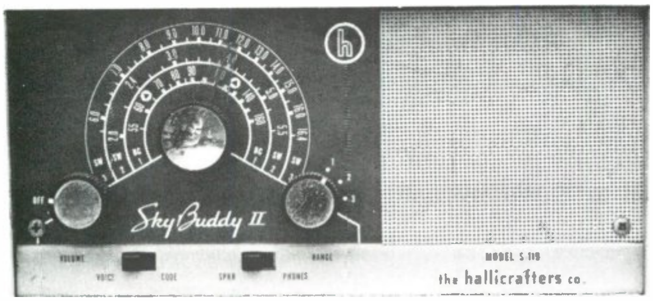
**MODEL:** SX-117 **YRS:** 1962-66 **PRICE:** $379.95 **BANDS:** 9, 500 kHz bands, 3-30 mHz **TYPE:** fixed Hfo, tunable IF, triple conversion **IF:** 6000-6500, 1650, 50.75 kHz **FILTER:** 50.75 kHz L/C **TUBES:** 13 + 4 Si diodes, 6DC6 rf, 6EA8 mix1/k fol, 12AT7 xco, 6BA6 if1, 6BE6 mix2, 6EA8 vfo/k fol, 6DC6 if2, 6EA8 mix3/SB xco sw osc, 6BA6 if3, 6BE6 prod det/bfo, 6BN8 det/avc amp/avc rect, 6GW8 af1/af out, 6AU6 calib, 2 HD6225 anl, 2 Si rect **ANT IN:** Phono jack, 50-70 Ω **AF OUT:** 3.2/500 Ω, .75 W spkr, 50-2000 Ω phones **REMARKS:** 4 additional 500 kHz bands available .085-30 mHz with optional crystals plus two optional crystal controlled positions. Coverage from .085-3 mHz provide with optional HA-10 tuner.



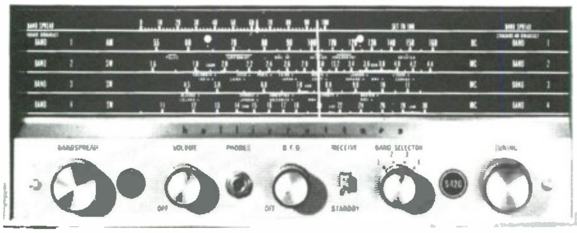
## HALLICRAFTERS



**MODEL:** S-118 **YRS:** 1962-65 **PRICE:** $99.95 **BANDS:** 5, .185-31 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 5 + 2 Si rect, 6BL8/ECF80 conv, 12BA6 if1, 6BL8 if2/bfo, 6T8 det/avc/af1, 6AQ5 af out **ANT IN:** Loopstick/ext ant bands 1 & 2, 3 screw term, 50-75 Ω **REMARKS:** Internal 4" speaker. Top pic may be prototype.



**MODEL:** S-119/K Sky Buddy II **YRS:** 1961-62 **PRICE:** $49.95, $39.95 kit **BANDS:** 3, .54-16.4 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 3 + Si diode + Si rect, 6BE6 conv, 6BA6 if/bfo, 6CM6 af1/af out, 1N295 det, si rect **ANT IN:** Loopstick band 1, unbal term band 2 & 3 **REMARKS:** Internal speaker. K = kit.



**MODEL:** S-120 **YRS:** 1961-65 **PRICE:** $69.95 **BANDS:** 4, .54-31 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 4 + Si rect, 12BE6 conv, 6BA6 if/bfo, 12AV6 det/avc/af1, 50C5 af out, sel rect **ANT IN:** Loopstick & unbal 50-600 Ω term band 1, 45" whip other bands **REMARKS:** AC/DC, internal 5" speaker, successor to S-38 series.

## HALLICRAFTERS

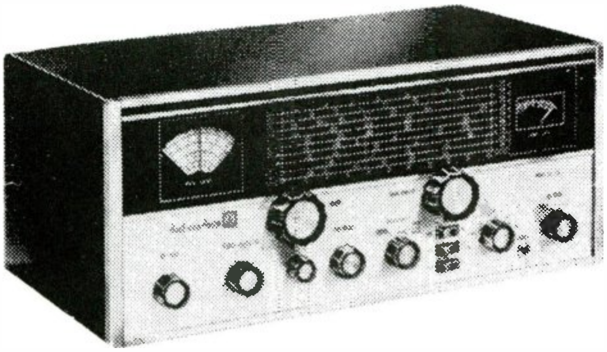
**MODEL:** SX-122 **YRS:** 1964-66 **PRICE:** $295 **BANDS:** 4, .538-34 mHz **TYPE:** Double conversion, tunable hfo **IF:** 1650, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 11 + si diode, 6DC6 rf, 6AU6 mix1, 6C4 hfo, 6DC6 if1, 6BL8 mix2/xco, 6BA6 if2, 6BE6 prod det/bfo, 6BN8 det/agc amp/agc rect, 1N456 anl, 6GW8 af1/af out, 5Y3 rect, OA2 vr **ANT IN:** 2 screw term, unbal, 50-70 Ω **AF OUT:** 1 W, 3.2 Ω.

**MODEL:** SX-122A **YRS:** 1967-70 **PRICE:** $395 **REMARKS:** Described as advanced SX-122 but has same tube lineup and external appearance. Perhaps $100 price increase is an advancement.

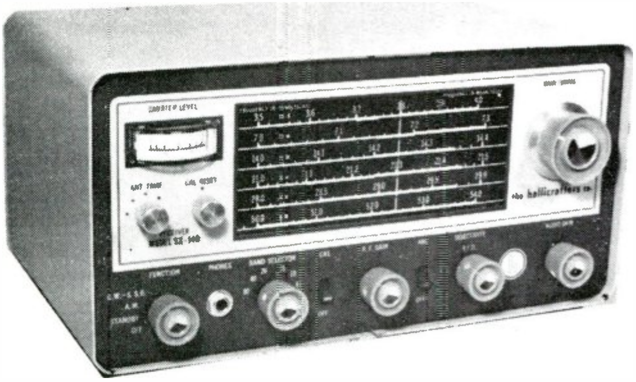
**MODEL:** S-129 **YRS:** 1965 **PRICE:** $164.95 **BANDS:** 4, .54-34 mHz **IF:** 1650 kHz **FILTER:** None **TUBES:** 7 + 1 diode, 6DC6 rf, 6EA8 mix/hfo, 6BA6 if1, 6BA6 if2, 6BE6 prod det/bfo, 6AL5 am det/nl, 6GW8 af1/af out, si rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 2 W, 3.2 Ω **REMARKS:** Same as SX-130 less "S" meter and crystal filter.

**MODEL:** SX-130 **YRS:** 1965-68 **PRICE:** $179.95 **REMARKS:** Same as S-129 with addition of "S" meter and crystal filter.

## HALLICRAFTERS

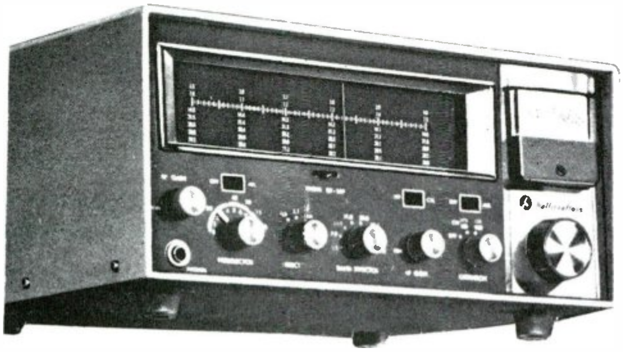


**MODEL**: SX-133 **YRS**: 1967-73 **PRICE**: $275 **BANDS**: 4, .535-31.5 mHz **FILTER**: Crystal **TUBES**: 7 + si rect, 6DC6 rf, 6EA8 conv, 6EA8 if1, 6BA6 if2, 6AL5 det/nl, 6BE6 bfo/prod det, 6GW8 af1/af out, si rect **REMARKS**: Bandspread calibrated for 80-10 meters plus 49, 31, 25, 19 meter SW BC bands.



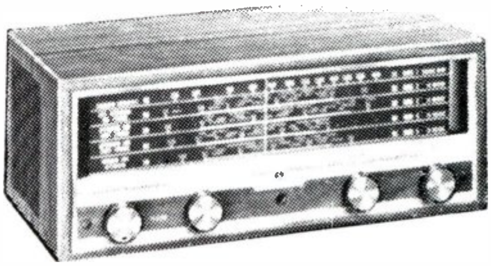
**MODEL**: SX-140 **YRS**: 1960-63 **PRICE**: $109.95 **BANDS**: 6, 80-6 mtr ham bands **IF**: 1650 kHz **FILTER**: Regen IF **TUBES**: 5 + 2 si rect, 6AZ8 rf/calib, 6U8 mix/hfo, 6BA6 if/bfo, 6T8A det/avc/anl/af1, 6AW8A af out/mtr amp, 2 si rect **ANT IN**: 2 screw term, 50-75 Ω **AF OUT**: 3.2 Ω.

**MODEL**: SX-140K **REMARKS**: SX-140 in kit form.



## HALLICRAFTERS

**MODEL**: SX-146 **YRS**: 1966-68 **PRICE**: $269.95 **BANDS**: 10, 500 kHz bands, 2-30 mHz **TYPE**: Single conversion, pre-mixer **IF**: 9000 kHz **FILTER**: Crystal lattice **TUBES**: 9 + 3 si diodes, 6JD6 rf, 12AT7 mix/k fol. 2 6AU6A if, 12AT7 det/avc/prod det, 12AT7 USB/LSB bfo, 6GW8 af1/af out, 6BA6 vfo, 6EA8 xco/pre mix, 1N456 anl, 1N456 avc gate, 1N3195 rect **ANT IN**: Phono jack, 50-75 Ω **AF OUT**: .75 W, 3.2 Ω **REMARKS**: Companion to HT-46.



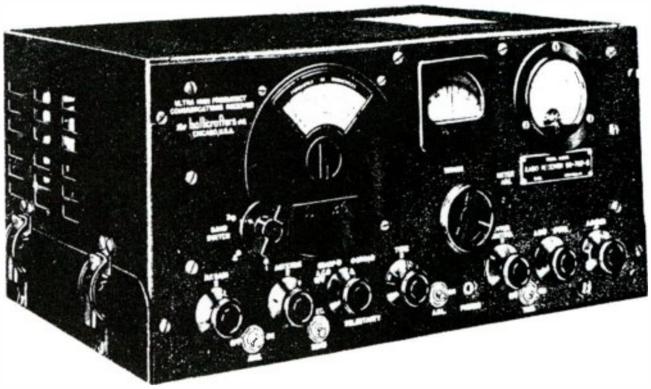
**MODEL**: S-200 Legionaire **YRS**: 1965-66 **PRICE**: $59.95 **BANDS**: 5, BCB + 19, 25, 31, 49 mtrs **IF**: 455 kHz **FILTER**: None **TUBES**: 4 + sel rect, 12BE6 conv, 12BA6 if, 12AV6 det/avc/af1, 50C5 af out, sel rect **ANT IN**: Loopstick Band 1, 2 screw term **REMARKS**: Internal 4" speaker.

**MODEL**: S-210 **YRS**: 1969 **BANDS**: 6, BC, 19, 25, 31, 49 mtrs + FM **TUBES**: 6 + si rect **REMARKS**: Similar to S-200 with FM band added.

**MODEL**: SW-500 **REMARKS**: Same as S-120, slightly different cabinet.

**MODEL**: 8R 40, 8R40C **REMARKS**: Similar to S-40B, slide-rule dial.

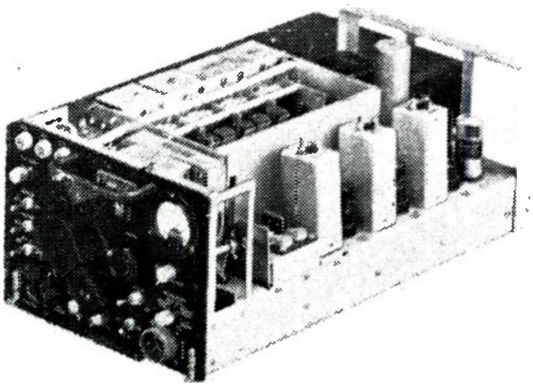
**MODEL**: AN/GRR-2 **REMARKS**: Signal Corps SX-28.



## HALLICRAFTERS

**MODEL:** BC-787B **BANDS:** 27-140 mHz **REMARKS:** Military S-36.

**MODEL:** R-44/ARR-5 **BANDS:** 3, 27-140 mHz **REMARKS:** Airborne version of S-36A, separate power supply.



**MODEL:** R-45/ARR-7 **BANDS:** 6, .55-42 mHz **TUBES:** 12, 6AB7(1853) rf1, 2 6SK7 rf2 & rf3, 6SA7 mix, 6SA7 hfo, 2 6SK7 if, 6H6 det/avc, 6SQ7 af1, 6J5 bfo, 6V6 af out, OD3/VR-150 vr **REMARKS:** Airborne version of SX-28A. Many were built by Belmont Radio Co.

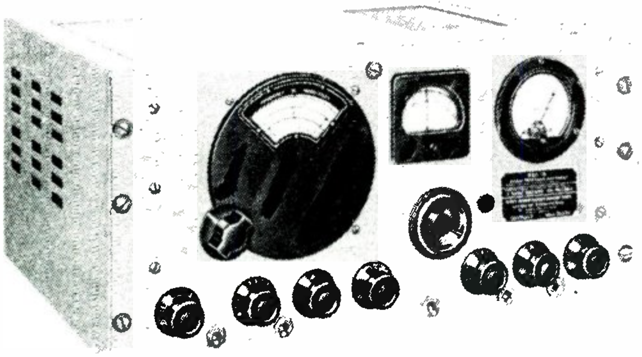
**MODEL:** R-62PR **REMARKS:** Signal Corps R-29.

**MODEL:** R-80 **REMARKS:** Military version of S-29 AC/DCBattery portable.

**MODEL:** R-137/GR **REMARKS:** Signal Corps S-36.

**MODEL:** R-205U **REMARKS:** Signal Corps SX-24.

**MODEL:** R-210/U **REMARKS:** Signal Corps S-22R.



## HALLICRAFTERS

**MODEL:** RBK-1 thru RBK-16 **YRS:** 1941-53 **BANDS:** 3, 27.8-143 mHz **IF:** 5250 kHz **FILTER:** None **TUBES:** 15 (same as S36A) **REMARKS:** USN version of S36, S36A.

**MODEL:** R-274/FRR **REMARKS:** Military designation for the SX-73 (and SP-600).

**MODEL:** R-649 **BANDS:** 5, 0.2-18 mHz **FILTER:** Xtal **TUBES:** 15 **REMARKS:** Built for USCG.

**MODEL:** SWE **REMARKS:** USAF No. for SX-116 (q.v.).

**MODEL:** WR-1000 **REMARKS:** S-120 in wooden case.

## HAMMARLUND

Oscar Hammarlund started the Hammarlund Manufacturing Company in 1910. In the 1920's the company, through an affiliate, Hammarlund-Roberts, Inc., manufactured broadcast receivers, and Hammarlund Mfg. Co. marketed components such as variable capacitors, coils and dials. The Hammarlund-Roberts name disappeared about 1932. The two companies used the same address on West 33rd Street in New York City.

Late in 1931 Hammarlund introduced the "Comet" receiver, perhaps the first superheterodyne communications receiver. They followed in the spring of 1932 with the improved "Comet Pro" model which continued in production, with variations, until 1935.

Design of the best known and long lived receiver in the Hammarlund line began in 1933. This was to be the ultimate receiver and was originally called the "Comet Super Pro" but it eventually became simply the Super Pro. Like National, Hammarlund took an uncompromising approach to receiver design. They used special custom built components. They designed a unique bandswitching system, special IF transformers, and a twelve gang tuning capacitor. Originally scheduled for release in early 1935, the receiver was not ready for delivery until mid-1936.

Hammarlund continuously updated the Super Pro and its descendents were in production until 1973. The original 1936 model was designated the SP-10 series. The SP-100 appeared in 1937, SP-200 in 1939, the SP-400 in 1946 and the SP-600 in 1950. The SP-600 was electrically and physically similar to the SP-10, with the addition of double conversion and rotary turret bandswitching. It was the ultimate refinement of the classic superheterodyne with the tunable HFO.

While Hallicrafters and, to a lesser extent, National, featured a large selection of receivers spaced $10 or $20 apart across the price spectrum from $29.50 and up, Hammarlund adopted a very conservative approach. The Super Pro, a top-of-the-line receiver, was their only model until 1938 when they brought out the HQ-120 to compete in the medium price range. This, too, became the forerunner of a line of receivers which lasted until 1973. Direct descendents of the HQ-120 were the HQ-129X (1945), HQ-140 (1953), HQ-150 (1956), HQ-160 (1958) and the HQ-180 (1959-73).

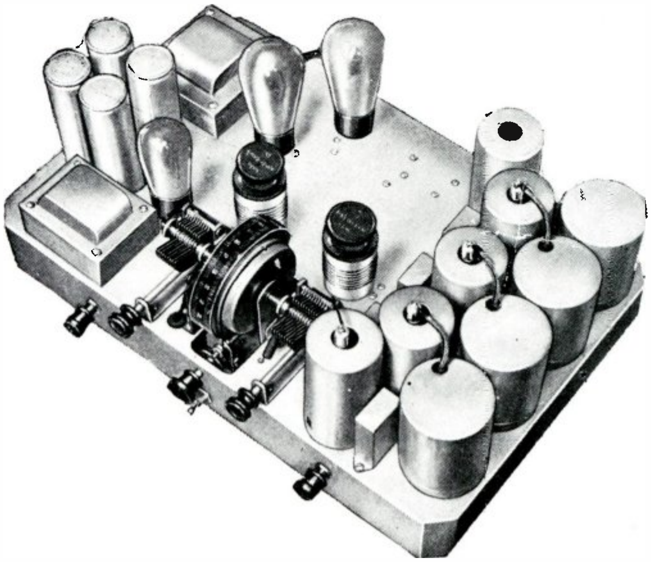
Beginning in 1955 Hammarlund manufactured a full line of receivers, most of them bearing the HQ prefix. Only the above models are descendents of the HQ-120. They can be distinquished from less expensive HQ's by their six tuning ranges and elaborate, multi-section variable tuning capacitors.

The only other notable receiver in the Hammarlund line was the PRO-310 which appeared briefly from 1955-57. It was a top-of-the-line receiver with a unique two dial tuning system. For unknown reasons its life was very short.

Time started running out for Hammarlund, as it did for the other communications receiver manufacturers, in the 1950's and 1960's. The company introduced a solid-state ham receiver, the HQ-215, in 1967 but it was not successful and they dropped out of the ham market after that although continuing to sell the HQ-180 and SP-600 until about 1973. The Hammarlund name then disappeared from the scene after more than 60 years.

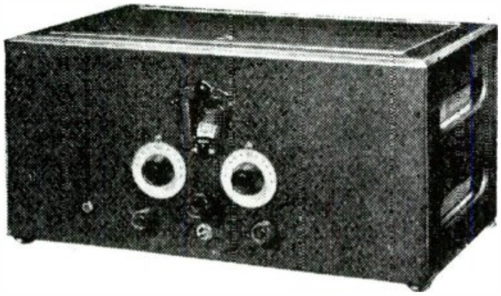
Hammarlund had begun transferring its manufacturing operations from New York City to Mars Hill, NC, in 1951 and completed the move in 1959. By 1965 all the management functions had also moved to Mars Hill. During its final two decades Hammarlund was sold a number of times. Telechrome purchased them in the late 1950's and then sold to Giannini Scientific in 1962 and who in turn sold to Electronic Assistance Corporation in the late 1960's.

Founder Oscar Hammarlund died in 1945. His son, Lloyd A Hammarlund, who had been actively managing the company since the early 1930's, continued the family's involvement. Stuart Meyer, W2GHK, a mobile two-way radio expert, guided the company from 1960 to 1966.

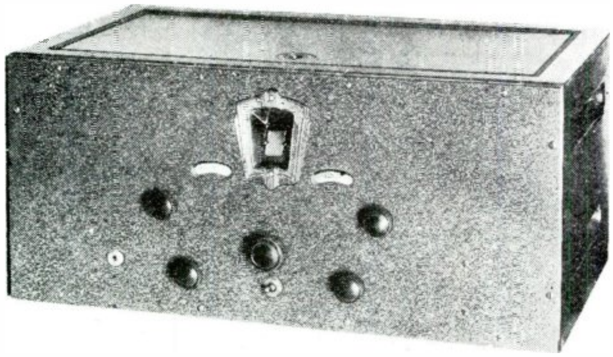


**MODEL:** Comet **YRS:** 1931-32 **PRICE:** $130 chassis, $175 console **BANDS:** 5, .55-21 mHz **IF:** 465 kHz **TUBES:** 8, 224A mix, 227 hfo, 2 235 if, 224A det, 227 bfo, 247 af out, 80 rect **ANT IN:** 2 screw term, unbal **AF OUT**: 7000 Ω, 2.7 W **REMARKS:** Plug-in coils. Note: unshielded coils provide coupling between HFO and mixer.

**MODEL:** Comet "All-Wave" **YRS:** 1932-33 **BANDS:** 5, .55-21 mHz **REMARKS:** Same as "Pro" (variation 2) with addition of BC band. Available in console or table model.



**MODEL:** Comet Pro (Prototype) **YRS:** 1932 **BANDS:** 4, 1.5-21 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 8 **REMARKS:** Plug-in coils. Bandsetting caps had external dial scales. Inductive coupling between mixer and HFO (coils not shielded). Walnut cabinet.

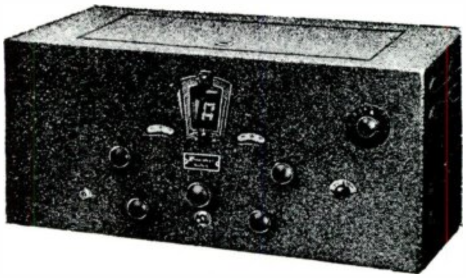


**MODEL:** Comet Pro (Variation 1) **YRS:** 1932 **BANDS:** 4, 1.5-21 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 8, 224A mix, 227 hfo, 2 235 if, 224A det, 227 bfo, 227 af out, 80 rect **ANT IN:** 2 screw term, A, G, unbal **REMARKS:** Same as prototype except dials for bandsetting caps are behind panel, viewed through windows. No power output stage. An optional unit was available containing p/p 245 af out, a speaker and power supply. Wood cabinet.

**MODEL:** Comet Pro (Variation 2) **YRS:** 1932-33 **BANDS:** 4, 1.2-20 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 8, 57 mix, 58 hfo, 2 58 if, 57 det, 58 bfo, 247 af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G **AF OUT:** 4000 Ω, 2.7 W **REMARKS:** Changes from Variation 1: new tube lineup, electron coupled HFO, metal or wood cabinet, more selective, full speaker volume, shield cans over plug-in coils, output xfmr.

**MODEL:** Comet Pro (Variation 2A) **YRS:** 1932-33 **REMARKS:** Battery model.

**MODEL:** Comet Pro (Variation 3) **YRS:** 1933-35 **PRICE:** $88.20 **BANDS:** 4, 1.5-20 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 8, 57 mix, 58 hfo, 2 58 if, 57 det, 58 bfo, 2A5 af out, 80 rect **ANT IN:** 3 screw, A, A, G **AF OUT:** 4000 Ω. 3 W **REMARKS:** Changes from Variation 2: AF output tube changed to 2A5, air tuned IF transformers, added BFO knob on panel.



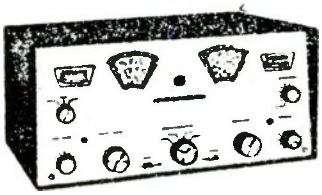
**MODEL:** Comet Pro (Variation 4) **FILTER:** Crystal **REMARKS:** Same as Variation 3 except adds crystal filter with a crystal switch and phasing control on panel.

**MODEL:** Comet Pro (Variation 5) **FILTER:** Crystal (Optional) **TUBES:** 9, 57 mix, 58 hfo, 2 58 if, 57 det, 58 bfo, 2B7 avc, 2A5 af out, 80 rect **REMARKS:** Differs from Variations 3 and/or 4 in addition of AVC tube and switch.

**MODEL:** Comet Pro (Variation 6) **REMARKS:** 110 VDC version of Variations 3-5.

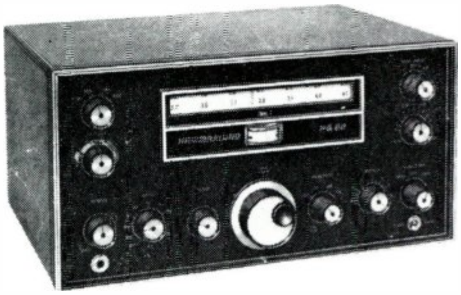
**MODEL:** Comet Pro (Variation 7) **REMARKS:** 220 VDC version of Variations 3-5.

**MODEL:** Comet Pro (Variation 8) **REMARKS:** Battery powered version of Variations 3-5.

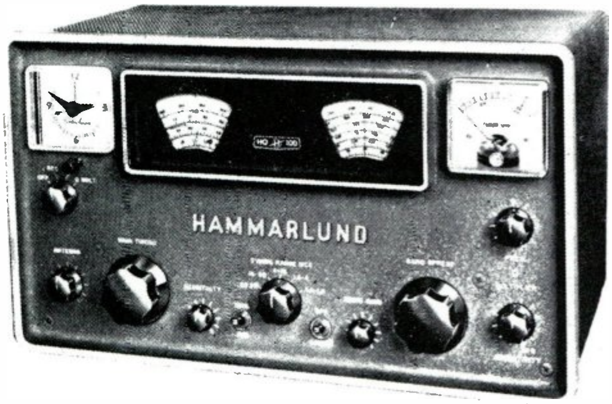


## HAMMARLUND

**MODEL:** HQ-66 **YRS:** 1964 **PRICE:** $159.95 **BANDS:** 4, .54-30 mHz **TUBES:** 10

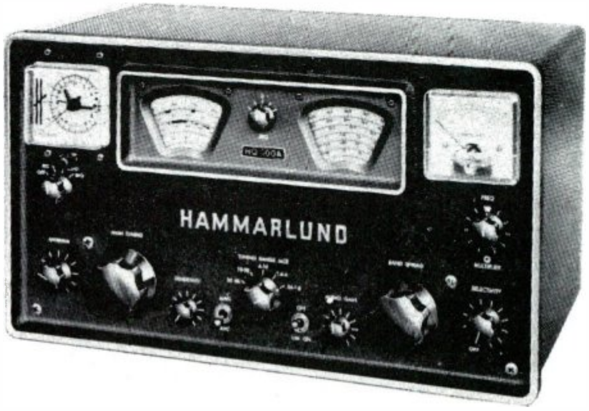


**MODEL:** HQ-88 **YRS:** 1964 **PRICE:** $299 **BANDS:** Ham Bands 160-10 mtrs + WWV **TYPE:** Double conversion, tunable hfo **IF:** ?, 262 kHz **FILTER:** Q multiplier, 262 kHz L/C **TUBES:** 10, 12BZ6 rf, 12AT7 mix2/xco, 6BR8 mix2/vfo, 2 12BA6 if, 6FM8 avc amp/avc det, 6BE6 prod det, 12AX7 q mult, 6GW8 af1/af out, 12BZ6 xtal calib, bridge rect, 5 semi diodes **ANT IN:** 50 Ω, SO239, 3 screw term **AF OUT:** 1 W, 3.2/500 Ω



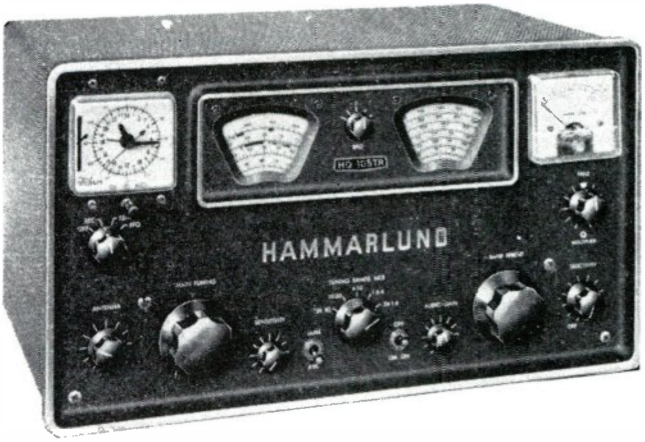
**MODEL:** HQ-100 **YRS:** 1956-60 **PRICE:** $169 **BANDS:** 4, .54-30 mHz **IF:** 455 kHz **FILTER:** Q Multiplier **TUBES:** 10, 6BZ6 rf, 6BE6 mix, 6C4 hfo, 2 6BA6 if, 6AL5 det/anl, 12AX7 af1/Q mult/bfo, 6AQ5 af out, OB2 vr, 5Y3 rect **ANT IN:** 50-600 Ω, 3 screw term **AF OUT:** 1 W. 3.2 Ω.

## HAMMARLUND

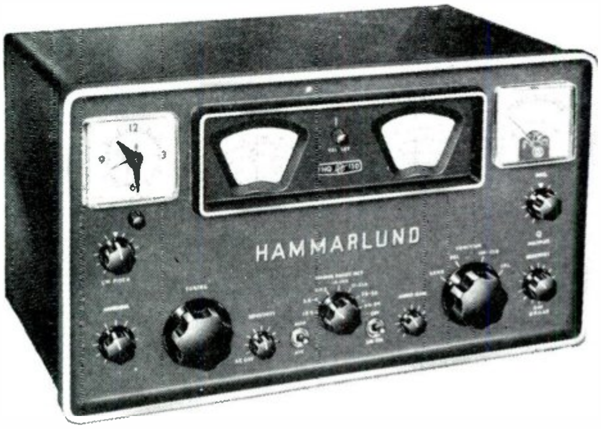


**MODEL:** HQ-100A **YRS:** 1961-64 **PRICE:** $189 **BANDS:** 4, .54-30 mHz **IF:** 455 kHz **FILTER:** Q multiplier **TUBES:** 10, 6BZ6 rf, 6BE6 mix, 6C4 hfo, 2 6BA6 if, 6BV8 det/anl/bfo, 12AX7 af1/q mult, 6AQ5 af out, OB2 vr, 5Y3 rect **ANT IN:** 50-600 Ω, 3 screw term **AF OUT:** 3.2 Ω, 1 W **REMARKS:** Changes from HQ-100: 6BV8 replaces 6AL5 for separate BFO and Q multiplier functions, CB channel markings on dial. Note: BFO knob between dials.

**MODEL:** HQ-100C **REMARKS:** HQ-100 with clock.

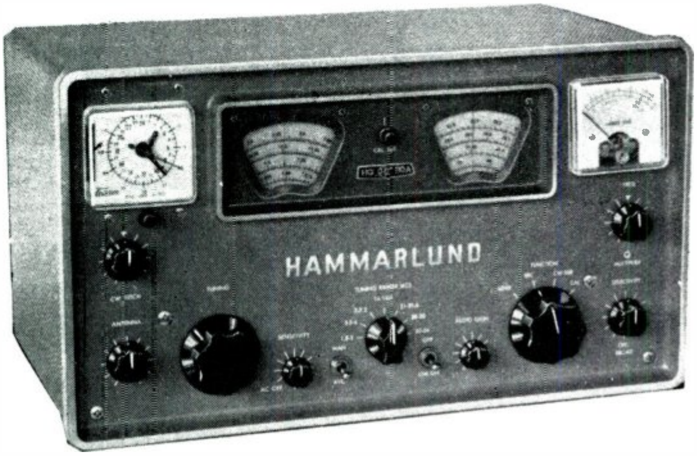


**MODEL:** HQ-105TR **YRS:** 1961 **PRICE:** $219.50 **TUBES:** 11, 6BZ6 rf, 6BE6 mix, 6C4 hfo, 2 6BA6 if, 6BV8 det/anl/bfo/avc, 12AX7 q mult/sp amp, 6BM8 af1/af out, 6CA4 rect, OB2 vr, 6CX8 xco/rf pwr amp **ANT IN:** phono jack, 50-600 Ω **AF OUT:** 1 W, 3.2 Ω **REMARKS:** HQ-100A with built-in 5 W. CB/10 mtr transmitter.



**MODEL:** HQ-110 **YRS:** 1957-61 **PRICE:** $229 **BANDS:** 7 Ham Bands, 160-6 mtrs **TYPE:** Double conversion, tunable hfo **IF:** 3045, 455 kHz **FILTER:** Q multiplier **TUBES:** 12, 6BZ6 rf, 6BE6 mix1, 6C4 hfo, 6BE6 mix2/xco, 12AX7 q mult/af1, 6BA6 if1, 6AZ8 if2/bfo, 6BJ7 det/anl/avc, 6BZ6 calib, 6AQ5 af out, OB2 vr, 5U4 rect **ANT IN:** 3 screw term **AF OUT:** 1 W, 3.2 Ω **REMARKS:** Single conversion below 7 mHz, double conversion above.

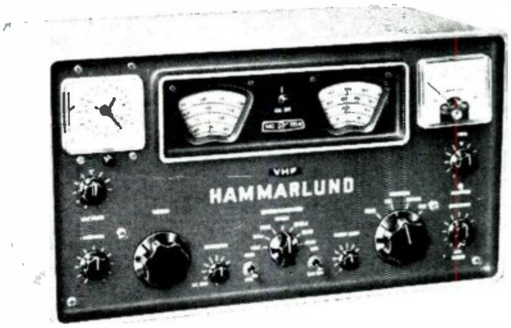
**MODEL:** HQ-110C **REMARKS:** HQ-110 with clock.



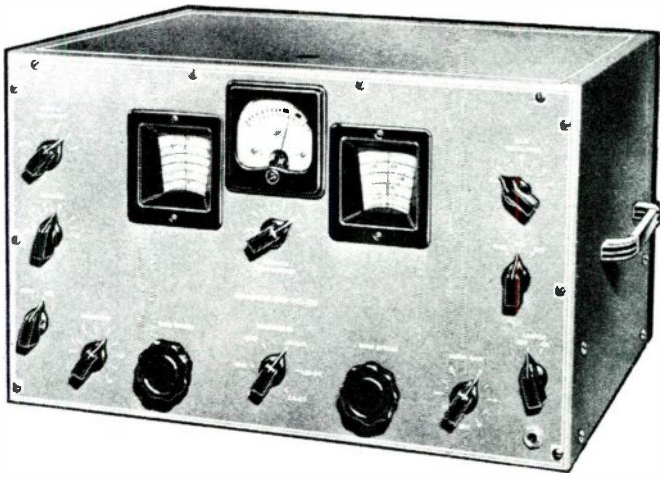
**MODEL:** HQ-110A **YRS:** 1962-67 **PRICE:** $249 **BANDS:** 7 Ham Bands, 160-6 mtrs **TYPE:** Double conversion, tunable hfo **IF:** 3045,455 kHz **FILTER:** Q multiplier **TUBES:** 12, 6BZ6 rf, 6BE6 mix1, 6C4 hfo, 6BE6 mix2/xco, 12AX7 q mult/af1, 6BA6 if1, 6AZ8 if2/bfo, 6BJ7 det/anl/avc, 6BZ6 calib, 6AQ5 af out, OB2 vr, 5U4 rect **ANT IN:** 3 screw term, phono jack 6 meters **AF OUT:** 1 W, 3.2 Ω **REMARKS:** Changes from HQ-110: accessory socket. 2 meter dial calibrations separate 6 meter coax input.

**MODEL:** HQ-110AC **REMARKS:** HQ-110A with clock.

**MODEL:** HQ-110AE **REMARKS:** Export model HQ-100A for 115/230 V., 50/60 Hz.



**MODEL:** HQ-110A-VHF **YRS:** 1965-69 **PRICE:** $299.95 **BANDS:** 8 ham bands, 160-2 mtrs **REMARKS:** HQ-110A with built-in 6 meter preamp and 2 meter converter using nuvistors.

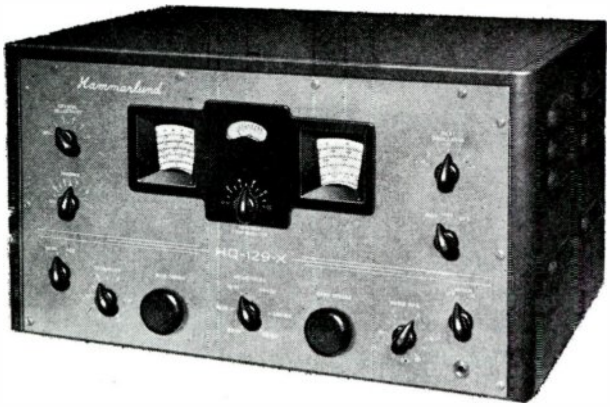


**MODEL:** HQ-120 **YRS:** 1938-44 **PRICE:** $117 (w/o crystal) **BANDS:** 6, .54-31 mHz **IF:** 465 kHz **FILTER:** Optional crystal **TUBES:** 12, 6S7 rf, 6K8 conv, 2 6S7 if, 6F6 if, 6H6 det/avc, 6H6 nl, 6J7 bfo, 6SF5 mtr amp, 6V6 af out, VR-150 vr, 5Z4 rect **ANT IN:** 3 screw term, A, A, G, 400 Ω **AF OUT:** 3 W, 6 Ω.

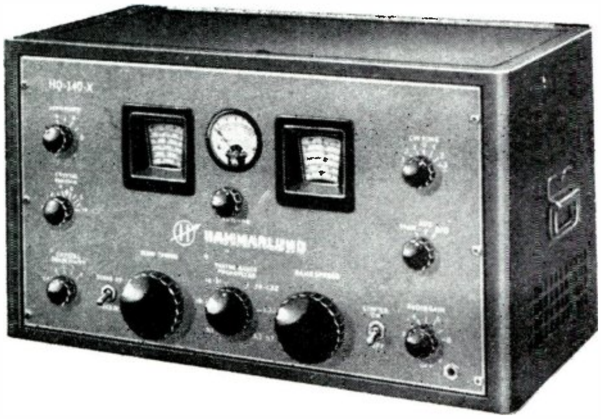
**MODEL:** HQ-120X **PRICE:** $129 **FILTER:** Crystal **REMARKS:** HQ-120 with crystal filter.

## HAMMARLUND

**MODEL:** HQ-120 (Special) **REMARKS:** Special model finished in black vs. the regular gray.

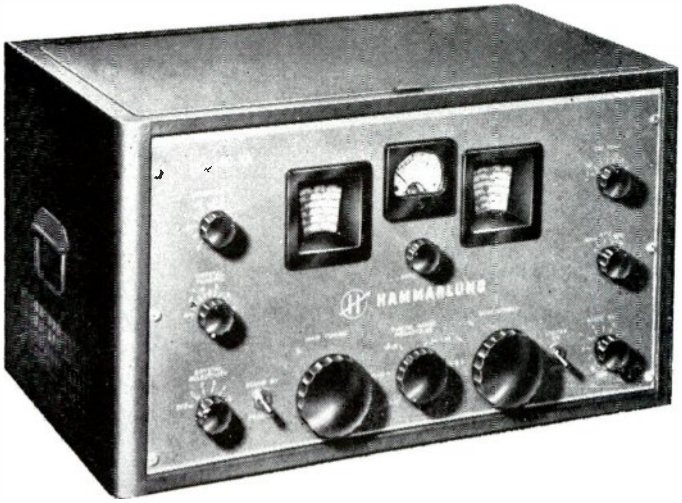


**MODEL:** HQ-129-X **YRS:** 1945-53 **PRICE:** $129 ($239 in '53) **BANDS:** 6, .54-31 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 11, 6SS7 rf, 6K8 conv. 3 6SS7 if, 6H6 det/avc/anl, 6SJ7 bfo, 6SN7 af1/meter amp, 6V6 af out, VR-105/OC3 vr. 5U4 rect **ANT IN:** 3 screw term, A, A, G, 400 Ω **AF OUT:** 3 W, 6 Ω **REMARKS:** Announced 1945, first delivery 1946, successor to HQ-120.

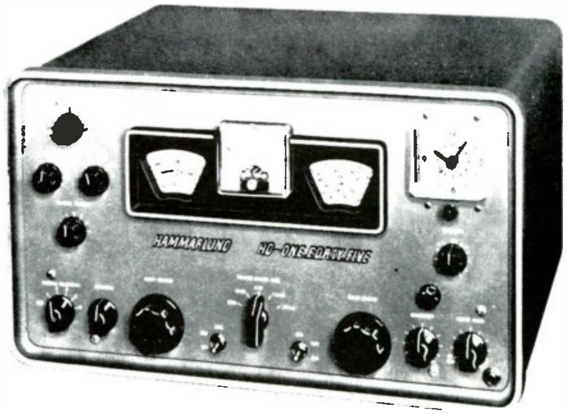


**MODEL:** HQ-140-X **YRS:** 1953-55 **PRICE:** $264.50 **BANDS:** 6, .54-31 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 11, 6BA6 rf, 6BE6 mix, 6C4 hfo, 3 6BA6 if, 6AL5 det/avc/anl, 12AU7 af1/bfo, 6V6 af out, VR-105/OC3 vr, 5U4 rect **ANT IN:** 3 screw term, A, A, G, 100 Ω **AF OUT:** 2 W, 6 Ω **REMARKS:** Successor to HQ-129-X. Has separate mixer and hfo, miniature tubes, other improvements.

## HAMMARLUND



**MODEL:** HQ-140-XA **YRS:** 1956-58 **PRICE:** $249 **REMARKS:** Improved sensitivity and more rugged dial, otherwise same as HQ-140X.



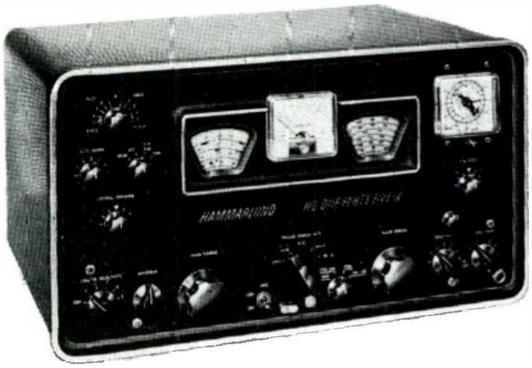
**MODEL:** HQ-145 **YRS:** 1959-61 **PRICE:** $269 **BANDS:** 4, .54-30 mHz plus special 20 meter range **TYPE:** Double conversion, tunable hfo **IF:** 3035, 455 kHz **FILTER:** Crystal, slot filter **TUBES:** 12, 6BZ6 rf, 6BE6 mix, 6C4 hfo, 6BE6 mix2/xco, 2 6BA6 if, 6AL5 det/avc/anl, 12AX7 af1/bfo, 6AQ5 af out, 6BZ6 calib, OB2 vr, 5U4 rect **ANT IN:** 3 screw term, bal, unbal **AF OUT:** 1 W, 3.2 Ω **REMARKS:** Single conversion to 10 mHz, double conversion above. Untuned RF on BC band.

**MODEL:** HQ-145A **YRS:** 1964-69 **REMARKS:** Changes from HQ-145: product detector, 110/230 V., 50/60 Hz power supply, "flip top" lid, silicon rectifier, accessory socket, systems socket for optional operation with HX-50, 3.2 and 500 ohm audio output, chassis cutout for coaxial antenna connector.

## HAMMARLUND

**MODEL:** HQ-145AX **REMARKS:** HQ-145A with 11 crystal positions for fixed frequency operation.

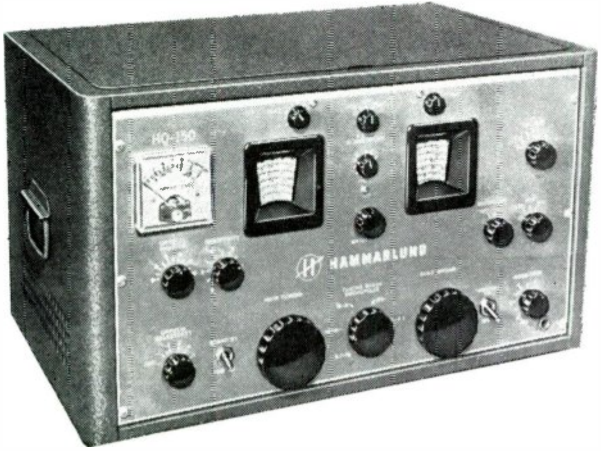
**MODEL:** HQ-145C **REMARKS:** HQ-145 with clock.



**MODEL:** HQ-145X **YRS:** 1961-64 **PRICE:** $269 **REMARKS:** Same as HQ-145 except adds one crystal cotrolled channel, CB channel markings on dial. Note xtal/noise limiter knob replaces noise limiter switch.

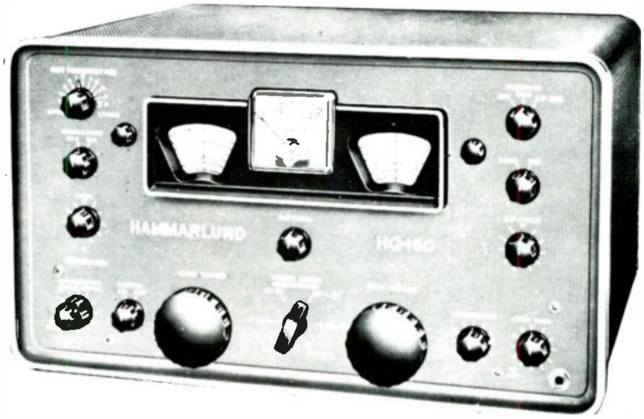
**MODEL:** HQ-145XC **REMARKS:** HQ-145X with clock.

**MODEL:** HQ-145XE **REMARKS:** Export model of HQ-145X with 115/230 V., 50/60 Hz power supply.

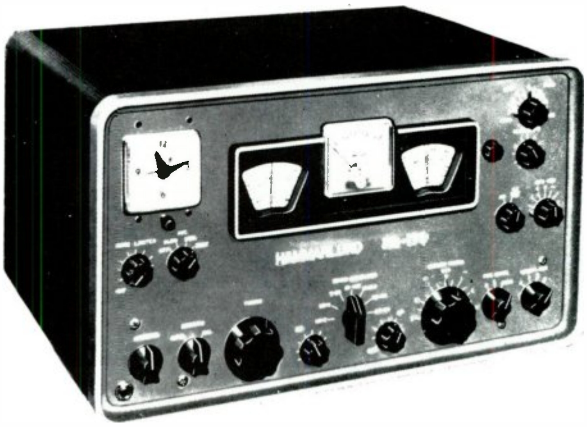


**MODEL:** HQ-150 **YRS:** 1956-58 **PRICE:** $294 **BANDS:** 6, .54-30 mHz **IF:** 455 kHz **FILTER:** Crystal and Q multiplier **TUBES:** 13, 6BA6 rf, 6BE6 mix, 6C4 hfo, 3 6BA6 if, 6AL5 det/anl/avc, 12AX7 af1/bfo, 12AX7 Q mult, 6BZ6 calib, 6V6 af out, VR-105/OC3 vr, 5U4 rect **ANT IN:** 3 screw term, A, A, G,50-300 Ω **AF OUT:** 2 W, 6 Ω **REMARKS:** Successor to HQ-120, HQ-129X and HQ-140.

## HAMMARLUND



**MODEL:** HQ-160 **YRS:** 1958-59 **PRICE:** $379 **BANDS:** 6, .54-31 mHz **TYPE:** Double conversion, tunable hfo **IF:** 3035, 455 kHz **FILTER:** Q multiplier, T-notch filter **TUBES:** 13, 6BA6 rf, 6BE6 mix1, 6C4 hfo, 6BE6 mix2/xco, 2 6BA6 if, 6BJ7 det/nl/avc, 12AX7 af1/q mult, 6U8 prod det/bfo, 6BZ6 calib, 6AQ5 af out, OB2 vr, 5U4 rect **ANT IN:** 3 screw term, A, A, G, 100 Ω **AF OUT:** 1 W, 3.2 Ω.



**MODEL:** HQ-170 **YRS:** 1958-62 **PRICE:** $359 **BANDS:** 7, 160-6 mtr ham bands **TYPE:** Triple conversion, tunable hfo **IF:** 3035, 455, 60 kHz **FILTER:** 60 kHz L/C **TUBES:** 17, 6BZ6 rf, 6BE6 mix1, 6C4 hfo, 6BE6 mix2/xco, 6BA6 if1, 6BE6 mix3/var osc, 2 6BA6 if2/if3, 6BV8 if4/det/avc, 12AU7 prod det, 6AL5 nl, 12AU7 bfo/mtr amp, 6AV6 af1/avc clamp, 6BZ6 calib, 6AQ5 af out, OB2 vr, 5U4 rect **ANT IN:** 3 screw term, 100 Ω **AF OUT:** 1 W, 3.2 Ω.

**MODEL:** HQ-170C **REMARKS:** HQ-170 with clock.

## HAMMARLUND

**MODEL:** HQ-170A **YRS:** 1962-68 **PRICE:** $369 **TUBES:** 16, elim 5U4, add si rect **ANT IN:** 3 screw term, 100 Ω, SO239 6 meters **REMARKS:** Changes from HQ-170; silicon rectifier, 2 meter dial scale, accessory socket, socket for transmitter/receiver contol, "flip open" lid, hfo/mix1 on continuously.

**MODEL:** HQ-170ARC **REMARKS:** HQ-170A for rack mounting, with clock.

**MODEL:** HQ-170A-VHF **YRS:** 1964-67 **PRICE:** $419.95 **BANDS:** 8, 160-2 mtr ham bands **TUBES:** 20, adds 4 nuvistors **REMARKS:** Built-in 6 mtr preamp and 2 mtr converter using nuvistors.

## HAMMARLUND

**MODEL:** HQ-180 **YRS:** 1959-62 **PRICE:** $429 **BANDS:** 6, .54-30 mHz **TYPE:** Triple conversion **IF:** 3035, 455, 60 kHz **FILTER:** 3035 kHz crystal, 60 kHz L/C **TUBES:** 18, 6BZ6 rf, 6BE6 mix1, 6C4 hfo, 6BE6 mix2/xco, 6BA6 if gate, 6BA6 if1, 6BE6 mix3/var osc, 2 6BA6 if, 6BV8 if4/det/avc, 12AU7 prod det, 6AL5 anl, 12AU7 bfo/s meter amp, 6BZ6 calib, 6AV6 af1/avc, 6AQ5 af out, OA2 vr, 5U4 rect **ANT IN:** 3 screw term, SO239, 72 Ω **AF OUT:** 1 W, 3.2 Ω.

**MODEL:** HQ-180C **REMARKS:** HQ-180 with clock.

**MODEL:** HQ-180RC **REMARKS:** Rack mounted HQ-180 with clock.

**MODEL:** HQ-180XE **PRICE:** $499.50 **REMARKS:** HQ-180 with 11 crystal controlled fixed channels and export power supply 115/230 V., 50/60 Hz.

**MODEL:** HQ-180AX **PRICE:** $499.50 **REMARKS:** HQ-180A with 11 crystal controlled fixed frequencies.

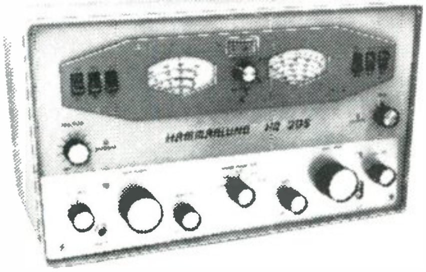
## HAMMARLUND

**MODEL:** HQ-180A **YRS:** 1963-72 **PRICE:** $439 **TUBES:** 17, same as HQ-180 less 5U4, adds 2 si rect **AF OUT:** 2.5 W, 3.2/500 Ω **REMARKS:** Changes from HQ-180; fixed/tunable bfo, silicon rectifers, accessory sockets, hfo/mix1 filaments on continuously, 115/230 V, 50/60 cycle power supply.

**MODEL:** HQ-180AC **REMARKS:** HQ-180A with clock.

HAMMARLUND HQ 200

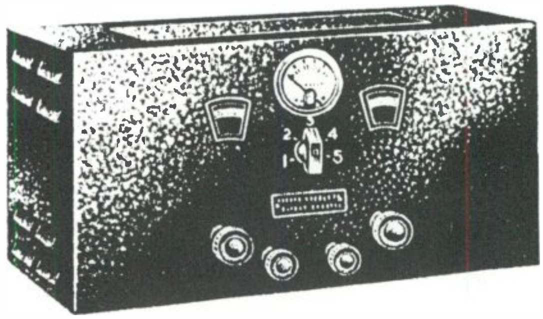
**MODEL:** HQ-200 **YRS:** 1969-72 **PRICE:** $229.50 **BANDS:** 5, .54-30 mHz **IF:** 455 kHz **FILTER:** Q mult **TUBES:** 8 + 5 semi diodes, 6BZ6 rf, 6BE6 mix, 6C4 hfo, 2 6BA6 if, 12AX7 af1/q mult, 6BE6 prod det/bfo, 6AQ5 af out, 1N34A am det, zener diode, 2 CER72C rect, 1N541A nl, **ANT IN:** Term, 30-100 Ω **AF OUT:** 2.5 W, 3.2 Ω.



**MODEL:** HQ-205 **YRS:** 1967-69 **PRICE:** $259 **BANDS:** .54-30 mHz **FILTER:** Q mult **REMARKS:** Includes a 5 W CB/10 meter transmitter with 6 crystal controlled channels.

## HAMMARLUND

**MODEL:** PRO-310 **YRS:** 1955-57 **PRICE:** $495 **BANDS:** 6, .55-32.5 **TYPE:** Double conversion, tuned hfo **IF:** 1802, 52 kHz **FILTER:** 52 kHz L/C **TUBES:** 13, 6BA6 rf, 6BE6 mix1, 6C4 hfo, 6BE6 mix2/xco, 2 6BZ6 if, 6AL5 det/avc, 6AN8 bfo/buff, 12AX7 af1/anl, 6V6 af out, 6AL5 bias rect, OB2 vr, 5U4 rect **ANT IN:** 75-300 Ω **AF OUT:** 2 W, 6 Ω **REMARKS:** Turret band switch. Only 1000 receivers produced.

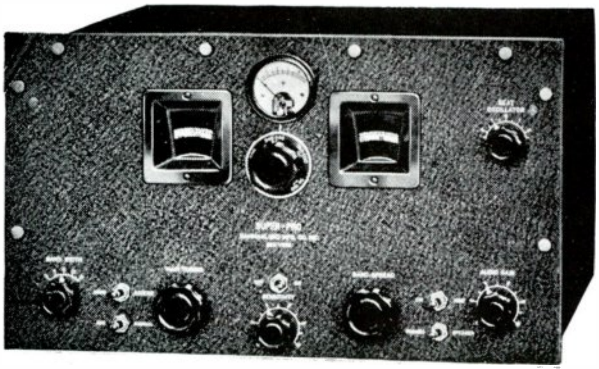


**MODEL:** SP-10 Super Pro (Prototype) **YRS:** 1935 **PRICE:** $182.28 **BANDS:** 5, .54-20 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 15, 2 6D6 rf, 6A7 mix, 6C6 hfo, 3 6D6 if, 6B7 if/det, 6B7 avc amp, 6V6 bfo, 42 af1, 2 42 af out, 5Z3 rect, 1V bias rect **AF OUT:** 18 W. **REMARKS:** Separate power supply.

## HAMMARLUND

**MODEL:** Super Pro SP-10 **YRS:** 1936 **PRICE:** $194 **BANDS:** 5, .54-20 mHz **IF:** 465 kHz **FILTER:** Crystal (Optional) **TUBES:** 16, 2 6D6 rf, 6A7 mix, 6C6 hfo, 3 6D6 if, 6B7 if/det, 6C6 bfo, 6B7 avc amp, 76 af1, 42 af2, 2 42 p/p af out, 1V rect, 5Z3 rect **ANT IN:** Screw term, bal/unbal, w/Faraday shields **AF OUT:** 600 Ω line/phones **REMARKS:** Separate power supply. Originally Comet Super Pro. Separate RF and IF gain controls.

**MODEL:** Super Pro SP10X **PRICE:** $211.68 **FILTER:** Crystal **REMARKS:** SP-10 with crystal filter.



**MODEL:** Super Pro SP-110 **YRS:** 1937-38 **PRICE:** $238.14 **BANDS:** 5, .54-20 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 16, 2 6K7 rf, 6L7 mix, 6J7 hfo, 3 6D6 if, 6B7 det, 6C6 bfo, 6B7 avc, 6C5 af1, 6F6 af2, 2 6F6 p/p af out. 2 rect **ANT IN:** 100 Ω, 2 screw term, A, A, bal **AF OUT:** 10 W, 8 Ω **REMARKS:** Variable coupling IF transformers for 3-16 kHz bandwidths, 0-2500 Hz calibrated BFO. RF and IF gain controls combined into sensitivity control. Separate power supply.

**MODEL:** Super Pro SP-110LF **BANDS:** 0.1-20 mHz **REMARKS:** Broadcast band replaced with low frequency band.

**MODEL:** Super Pro SP-110X **FILTER:** Crystal **REMARKS:** SP-110 with crystal filter.

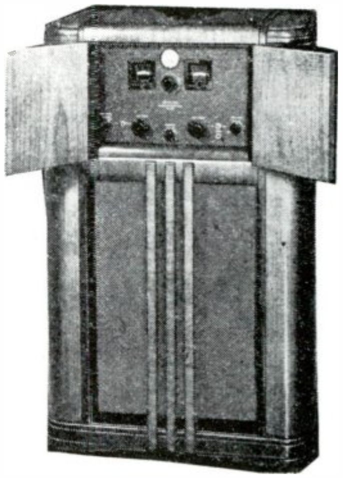
**MODEL:** Super Pro SP-110S **BANDS:** 5, 1.25-40 mHz **REMARKS:** SP-110 with special tuning range.

## HAMMARLUND

**MODEL:** Super Pro SP-110SX **FILTER:** Crystal **REMARKS:** SP-110S with crystal filter.

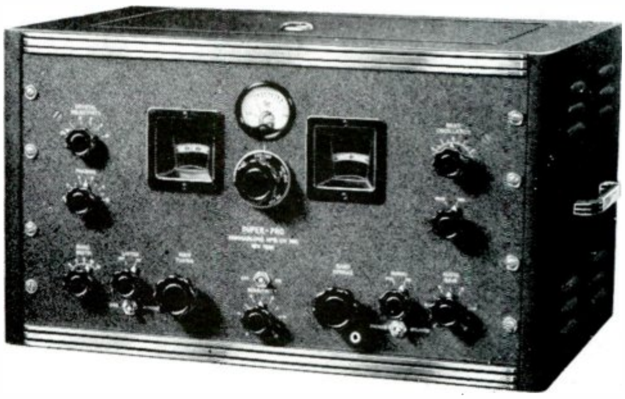
**MODEL:** SP-120X **REMARKS:** SP-110X with 12" high fidelity speaker.

**MODEL:** SP-120SX **REMARKS:** SP-110SX with 12" high fidelity speaker.



**MODEL:** Super Pro SP-150 **REMARKS:** Console model of SP-110. Walnut finished panel, brown bakelite knobs, gold-filled engraved labels, bronze tuning meter case, brass band switch scale. Console contains 15" bass reflex speaker. Simplified operation with elimination of send-receive switch, speaker phones switch, BFO pitch control, off-on switch (added to audio gain control). Added phone jack to front panel.

**MODEL:** SP-150S **BANDS:** 5, 1.25-40 mHz **REMARKS:** SP-150 with special tuning range.



## HAMMARLUND

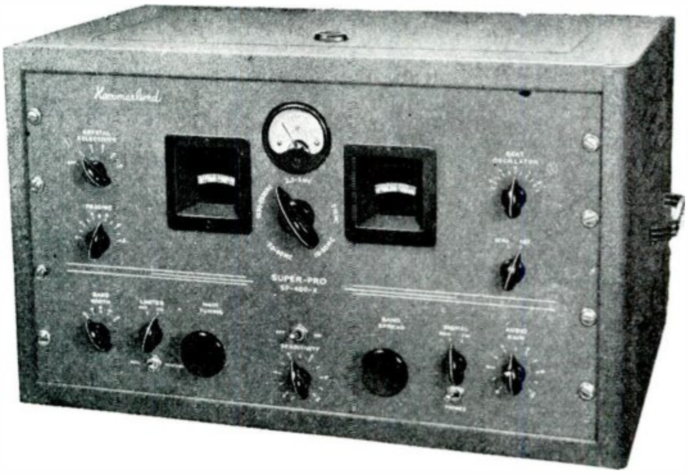
**MODEL:** SP-210X **YRS:** 1939-45 **PRICE:** $279 **BANDS:** 5, .54-20 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 18, 2 6K7 rf, 6L7 mix, 6J7 hfo, 6K7 if1, 2 6SK7 if2/3, 6H6 det, 6N7 nl, 6SJ7 bfo, 6SK7 avc amp, 6H6 mtr rect/avc rect, 6C5 af1, 6F6 af2, 2 6F6 p/p af out, 5Z3 rect, 80 rect **ANT IN:** 2 screw term, 100 Ω, A, A, bal/unbal **AF OUT:** 16 W. **REMARKS:** Separate power supply, supplied with 10" speaker.

**MODEL:** SP-210SX **BANDS:** 5, 1.25-40 mHz **REMARKS:** Same as SP-210X except for tuning range.

**MODEL:** SP-210 LX **BANDS:** 0.1-20 mHz **REMARKS:** Broadcast band replaced with low frequency band.

**MODEL:** SP-220SX **REMARKS:** SP-210SX with 12" speaker.

**MODEL:** SP-220X **REMARKS:** SP-210X with 12" speaker.



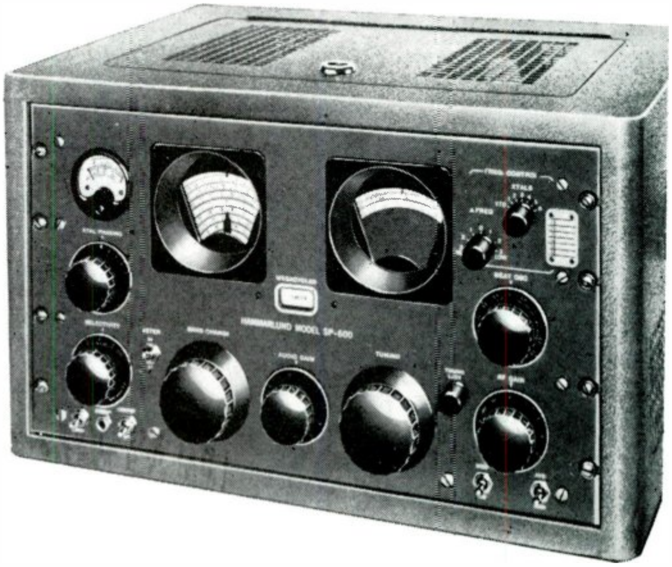
**MODEL:** SPC-400X **YRS:** 1946-47 **PRICE:** $342 **BANDS:** 5, .54-30 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 18, 2 6K7 rf, 6L7 mix, 6J7 hfo, 6K7 if1, 2 6SK7 if2/3, 6H6 det, 6N7 nl, 6SJ7 bfo, 6SK7 avc amp, 6H6 avc rect, 6J5 af1, 6F6 af2, 2 6V6 p/p af out, 5Y3 bias rect, 5U4 hv rect **ANT IN:** Screw term, 100 Ω, bal/unbal **AF OUT:** 8 W, 500 Ω **REMARKS:** Separate power supply, cabinet model.

**MODEL:** SPR-400X **REMARKS:** Rack mounted model.

## HAMMARLUND

**MODEL:** SPC-400SX **BANDS:** 5, 1.25-40 mHz **REMARKS:** SPC-400X with special tuning range.

**MODEL:** SPC-600-X (Prototype) **YEARS:** 1948 **PRICE:** $395 **BANDS:** 6, .54-54 mHz **FILTER:** Crystal **TUBES:** 19, 3 6BA6, 2 6BE6, 2 6C4, 6J5, 4 6SG7, 6SN7, 2 6H6, 2 6V6, 5U4, VR150 **REMARKS:** Differs in appearance and tubes from SP-600, probably a prototype that was never delivered.



**MODEL:** SP-600 (Generic Model) **YEARS:** 1950-72 **PRICE:** $985 **BANDS** 6, .54-54 mHz **TYPE:** Double conversion **IF:** 3955, 455 kHz **FILTER:** Crystal **TUBES:** 20, 2 6BA6 rf, 6BE6 mix 1, 6C4 hfo, 6BA6 gate, 6BE6 mix 2, 6C4 xco, 3 6BA6 if, 12AU7 k fol/af1, 6AL5 det/avc, 6C4 bfo, 6BA6 buff, 6AL5 anl/mtr rect, 6AC7 xco, 6V6 af out, 6AL5 bias rect, 5R4 rect, OA2 vr **ANT IN:** 100 Ω, MIL conn, bal/unbal **AF OUT:** 2.5 W, 600 Ω spkr, 15 mW, 8000 Ω phones

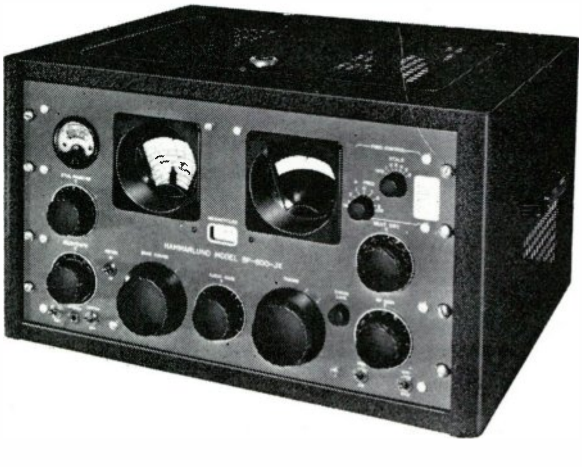
## HAMMARLUND

**REMARKS:** 10,000 produced by 1953, turret coil switching, military designation R-274.

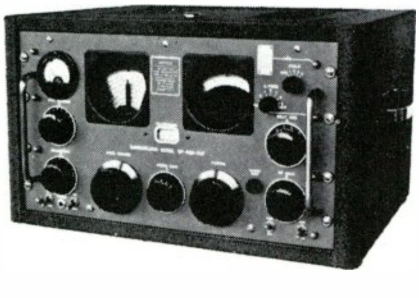
**MODEL:** SP-600J **REMARKS:** "J" indicates JAN level construction and components.

**MODEL:** SP-600X **REMARKS:** "X" indicates the model includes six crystal controlled channels.

**MODEL:** SP-600JLX **PRICE:** $1260 **BANDS:** 6, 0.1-0.4, 1.35-29.7 mHz **REMARKS:** Low frequency SP-600JX.

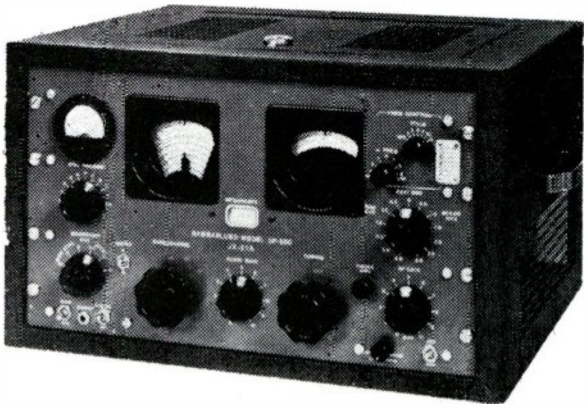


**MODEL:** SP-600JX **REMARKS:** JAN level receiver with six crystal controlled channels.



**MODEL:** SP-600VLF **PRICE:** $1975 (1956) **BANDS:** 6, .01-540 kHz **REMARKS:** VLF version of SP-600. Has six crystal controlled channels.

## HAMMARLUND



**MODEL:** SP-600JX-21A **YRS:** 1972 **PRICE:** $1595 **TUBES:** 22 **ANT IN:** SO239, 100 Ω **REMARKS:** Last of the SP-600 series updated for SSB. **CHANGES:** MOD/CW switch replaced with rotary LSB/USB/CW/MOD switch, SO239 replaces twin coax connector, markings engraved on panel rather than on knob skirts.

### SP-600 SUFFIX NUMBERS

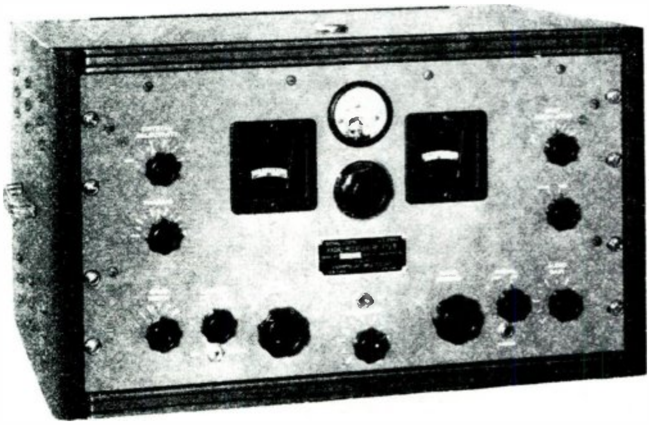
Courtesy Robert Fowle, Amateur Radio Surplus

| SUFFIX | DESCRIPTION |
|---|---|
| JX-1 | Sig C R274A, SP-600JX (q.v.) |
| JLX-2 | SP-600-JLX (q.v.) |
| J-3 | Standard SP-600J (q.v.) |
| J-4 | SP-600-J w/IF GAIN control and AVC and DIODE outputs for diversity. Sig C R-320A |
| J-5 | SP-600J, w/25 Hz P/S |
| JX-6 | AVC & DIODE outputs. Navy R-274B. |
| JX-7 | Standard receiver |
| JX-8 | Single (unbal) coax input |
| JL-9 | SP-600-JLX w/o xco unit |
| JX-10 | Standard SP-600JX (q.v.) |
| J-11 | JX-10 w/o xco unit. USN |
| JX-12 | Standard receiver. R-274A |
| J-13 | Same as J-5 |
| JX-14 | Same as JX-10. R-274C |
| JLX-15 | SP-600-JLX |
| JL-16 | SP-600-JLX w/o xco unit |
| JX-17 | Diversity receiver for Air Materiel Comm. Red knobs. |
| JX-18 | Std rcvr made for GAUVREAU |
| J-19 | Same as J-5, J-13 |
| J20 | J-19 for Sig C, R-483A |
| JX-21 | Replaces JX-10. Standard SP-600-JX model |

## HAMMARLUND

| | |
|---|---|
| JX-21A | (See separate listing) |
| J-22 | Replaces J-11 |
| JLX-23 | Replaces JLX-15 |
| JL-24 | Replaces JL-16 |
| JL-24Spcl | USN R-274B w/minor mod |
| J-25 | Replaces J-19 |
| JX-26 | R-274C for Sig C |
| JLX-27 | JLX-23 w/minor mods |
| JX-28 | Sig C R-620 |
| JX-29 | JX-21 w/single coax conn for CIA |
| JX-30 | JX-17 w/JX-28 mods |
| VLF-31 | SP-600VLF (q.v.) |
| JX-32 | JX-21 w/minor mods |
| JLX-33 | JX-17 w/SP-600JLX freq range |
| JL-34 | J-22 except 0.1-0.2, .54-14.8 mHz range for CIA |
| JX-35 | JX-21 w/0-10 kHz BFO. USN R-274B |
| JX-36 | JX-21 w/audio input jack. For FBI |
| JX-37 | JX-21 w/25 Hz P/S |
| VLF-38 | VLF-31 w/25 Hz P/S |
| JX-39 | JX-21 for FAA |

**MODEL:** AACS **BANDS:** 0.3-10 mHz **REMARKS:** Military version of Super Pro.



**MODEL:** BC-779/A/B **YRS:** 1942-46 **BANDS:** 5, 0.1-0.4, 2.5-20 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 16 **REMARKS:** Military SP-200, separate power supply.

**MODEL:** BC-779/129-U **BANDS:** 5, 0.3-10 mHz.

**MODEL:** BC-789 **REMARKS:** Military SP-400.

## HAMMARLUND

**MODEL:** BC-794 **YRS:** 1942-46 **BANDS:** 5, 1.25-40 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 16 **REMARKS:** Military SP-200, separate power supply. Same as BC-779 except frequency coverage.

**MODEL:** BC-796 **REMARKS:** Super Pro.

**MODEL:** BC-799/A/B/C **REMARKS:** Super Pro.

**MODEL:** BC-1004/A/B/C/D **BANDS:** 5, .54-20 mHz **REMARKS:** Same as BC-779 except for frequency coverage.

**MODEL:** R-129/U **REMARKS:** Same as BC-779/129-U, qv.

**MODEL:** R-270 **REMARKS:** BC-794.

**MODEL:** R-274A **REMARKS:** SP-600-JX-1, -JX-12.

**MODEL:** R-274B **REMARKS:** SP-600-JX-6, -JX-35.

**MODEL:** R-274C **REMARKS:** SP-600-JX-14, -JX-26.

**MODEL:** R-320A **REMARKS:** SP-600-J-4, diversity..

**MODEL:** R-483 **REMARKS:** SP-600-J-20, part of SCR-24D.

**MODEL:** R-542 **REMARKS:** SP-600.

**MODEL:** R-620 **REMARKS:** SP-600-JX-28

CRYSTAL SELECTIVITY
PHASING
BEAT OSCILLATOR
MAN AVC BFO
RADIO RECEIVER
ANTENNA COMPENSATOR
SEND REC
SENSITIVITY
MAIN TUNING
MEGACYCLES
BAND SPREAD
AUDIO GAIN
LIMITER OFF ON
OFF

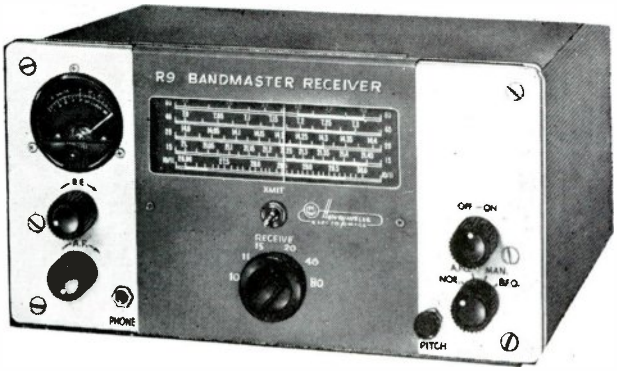
Photo courtesy Jack Woods

## HAMMARLUND

**MODEL:** RBG-2 **YRS:** 1943 **BANDS:** 6, .54-31, calibrated bandspread 4-4.6, 8-9.6, 12-13.6, 15-18 mHz **IF:** 455 kHz, **FILTER:** Crystal **TUBES:** 11, 6SK7 rf, 6K8 conv, 3 6SK7 if, 6H6 det/avc/nl, 6C5 af1, 6SJ7 bfo, 6V6 af out, VR105 vr, 5U4 rect **REMARKS:** Navy receiver type CHC-46140. Appears to be early HQ-129.

## HARVEY-WELLS

Cliff Harvey, W1RF, and John Wells, W1ZD, formed Harvey-Wells Electronics, Southbridge, MA (later Natick, MA) in 1939. Dick Mahler, W1DQH, joined them and eventually rose to be president of the company for 20 years. Harvey-Wells manufactured police radios, transceivers, transmitters and crystals. Their best known product was the TBS-50 Bandmaster transmitter. Cliff Harvey died in 1987 at the age of 79. He had formerly founded Harvey Radio Labs and Hendricks and Harvey.



**MODEL:** R-9 **YRS:** 1954-56 **PRICE:** $149.50 **BANDS:** 5, 10-80 mtrs **TYPE:** Double conversion, variable hfo **IF:** 1600, 260 kHz **FILTER:** Optional **TUBES:** 10, 6BJ6 rf, 6U8 mix1/hfo, 6U8 mix2/xco, 2 6BJ6 if, 6AL5 det/nl, 12AX7 af1/bfo, 6CM6 af out, OA2 vr, 5Y3 rect **ANT IN:** 50 Ω, phono jack **AF OUT:** 5 W, 3.2/600 Ω. **REMARKS:** Internal 115 V. power supply, can be powered by external 6/12 V. vibrator or dynamotor power supply.

**MODEL:** R-9A **YRS:** 1958 **PRICE:** $149.50 **BANDS:** 5 ham bands, 10-80 mtrs **TYPE:** Double conversion, variable hfo **IF:** 1600, 260 kHz.

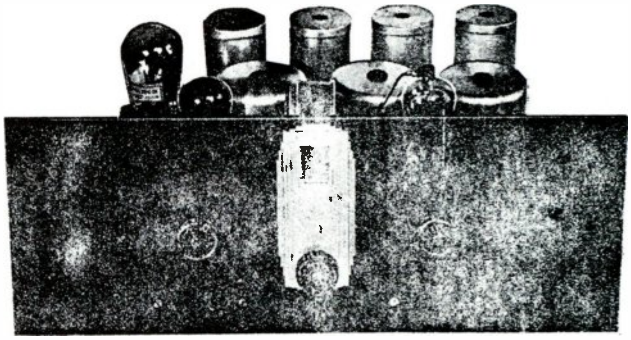
## HARVEY-WELLS

**MODEL:** RG-9A **BANDS:** 6, .54-32 mHz **REMARKS:** General coverage version of R-9A.

## HATRY & YOUNG

Hatry & Young, 119 Ann St, Hartford, CT, is another candidate for the honor of manufacturing the first commercial communications receiver for amateurs. They ran an ad in the July, 1930, *QST* containing testimonials from W3PT, W1AGZ, W1CMP, W1HN and others praising their HY-7 superheterodyne. The set covered 1.7 to 15 mHz in six bands with a 1525 kHz IF.

L. W. Hatry designed the receiver and it was farmed out to an assembly house for manufacturing. H. L. Chadbourne told me that he visited Hatry & Young frequently in those days and saw many HY-7's there, both assemblied and in kit form.



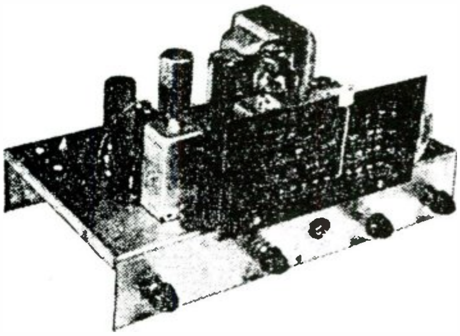
**MODEL:** HY-7 **YRS:** 1929-31 **BANDS:** 6, 1.7-15 mHz **IF:** 1525 kHz **FILTER:** Regen 2nd detector **TUBES:** 6, 22 mix, 01A hfo, 2 22 if, 40 or 12A regen det, 01A or 12A af out **ANT IN:** unbal, hi Z **AF OUT:** 4500 Ω, 2 W. **REMARKS:** Battery set, plug-in coils, kit or wired.

**MODEL:** HY-7A **REMARKS:** No info.

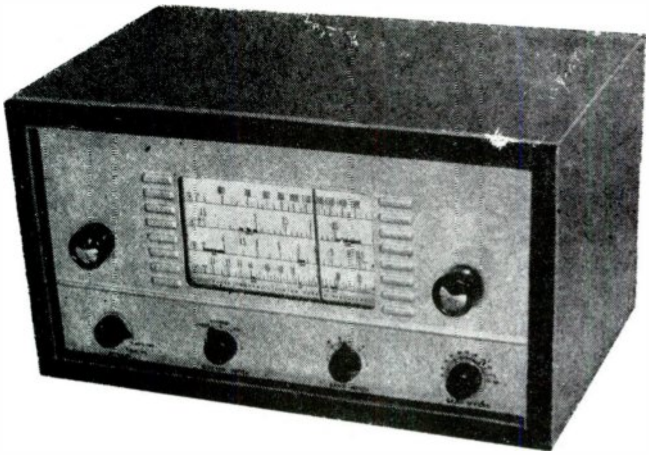
**MODEL:** HY-7B **YRS:** 1931-32 **BANDS:** 5, 2.0-15.2 mHz **IF:** 1525 kHz **FILTER:** Regen 2nd detector **TUBES:** 7, 24 mix, 27 hfo, 2 24 if, 24 regen det, 27 af1, 45 af out **ANT IN:** unbal, hi Z **AF OUT:** 4500 Ω, 2 W. **REMARKS:** Separate power supply, plug-in coils, kit or wired.

## HEATH

Heath Co, Benton Harbor, MI, descended from the Aerial Vehicle Co, later the Heath Airplane Co. Founder Edward Heath died in an airplane crash in 1931. After World War II the company started offering test equipment kits utilizing surplus components. The first kit was the OT-1 five inch oscilloscope. The product line rapidly expanded to include additional test equipment and then ham equipment. The company was purchased by Daystrom in 1955. They shut down their kit operation in 1992.

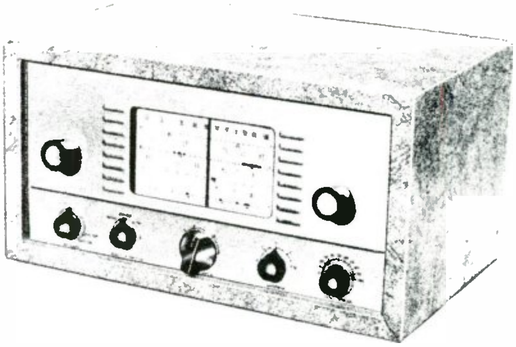


**MODEL:** AR-1 **YRS:** 1950-53 **PRICE:** $23.50 **BANDS:** 3, .55-20 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 12SH7 mix, 1626 hfo, 12SH7 if1, 12C8 det/avc/af1, 12A6 af out, 5Y3 rect **REMARKS:** Kit, BC type receiver, no BFO, bandspread, or phone jack.

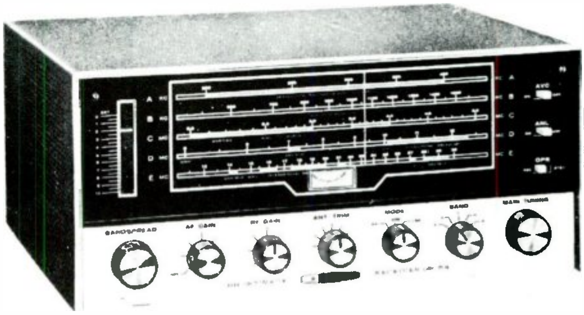


**MODEL:** AR-2 **YRS:** 1953-56 **PRICE:** $25.50 **BANDS:** 4, .55-35 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 12BE6 conv, 12BA6 if, 12AV6 det/avc/af1, 12BA6 bfo, 12A6 af out, 5Y3 rect **ANT IN:** Term, 50 Ω **AF OUT:** 3.4 W, 8 Ω **REMARKS:** Kit, internal speaker.

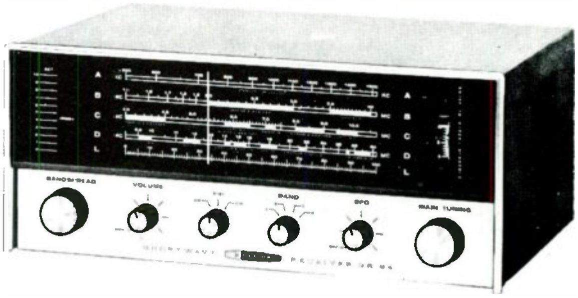
## HEATH



**MODEL:** AR-3 **YRS:** 1956-60 **PRICE:** $29.95 **BANDS:** 4, .55-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 6, 12BE6 conv, 12BA6 if, 12AV6 det/avc/af1, 12BA6 bfo, 12A6 af out, 5Y3 rect **ANT IN:** 50 Ω, term **AF OUT:** 3.4 W, 8 Ω **REMARKS:** Kit, internal speaker. New high Q slug tuned coils, new layout, new type IF transformers.



**MODEL:** GR-54 **YRS:** 1966-68 **PRICE:** $84.95 **BANDS:** 5, .18-.42, .54-30 mHz **IF:** 1682 kHz **FILTER:** xtal **TUBES:** 6 + 8 diodes, 6BH6 rf, 6EA8 mix/hfo, 2 6BA6 if, 12AT7 prod det/bfo, 6HF8 af1/af out, 8 diodes avc/det/anl/rect **AF OUT:** 8 Ω **REMARKS:** Kit.



**MODEL:** GR-64 **YRS:** 1966-68 **PRICE:** $39.95 **BANDS:** 4, .55-30 mHz **FILTER:** None **TUBES:** 4 + 2 si rect **REMARKS:** Kit, internal speaker.

## HEATH

**MODEL:** GR-91 **YRS:** 1961 **PRICE:** $39.95 **BANDS:** 4, .55-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 4 + rect, 12BE6 conv, 12BA6 if/bfo, 12AV6 det/af1, 50C5 af out, si rect **ANT IN:** Term 75 Ω bal, 300 Ω unbal **REMARKS:** Internal speaker.

**MODEL:** HR-10 **YRS:** 1963-66 **PRICE:** $79.95 **BANDS:** 5 ham bands, 80-10 mtrs **IF:** 1680 kHz **FILTER:** Crystal lattice **TUBES:** 7, 6BZ6 rf, 6EA8 mix/hfo, 6BA6 if, 6EA8 if/bfo, 6BJ7 det/avc/anl, 6EB8 af1/af out, 6X4 rect **ANT IN:** Phono jack, 50-75 Ω **AF OUT:** 8/500 Ω **REMARKS:** Kit.

**MODEL:** HR-10B **YRS:** 1967-68 **PRICE:** $75 **BANDS:** 5 ham bands, 80-10 mtrs **REMARKS:** Kit. Painted to match DX-60B.

## HEATH

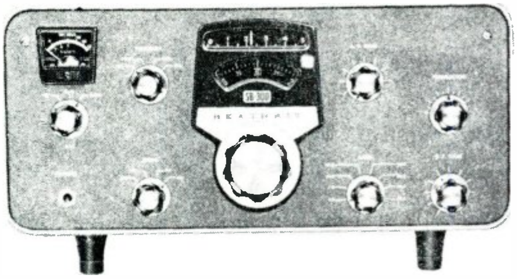
**MODEL:** HR-20 **YRS:** 1962-64 **PRICE:** $134.50 **BANDS:** 5 ham bands, 80-10 mtrs **IF:** 3000 kHz **FILTER:** Crystal lattice **TUBES:** 8, + diode + trans, 6BZ6 rf, 6EA8 mix/hfo, 6BZ6 if1, 6EA8 if2/mtr amp, 6BJ7 det/avc/nl, 6BE6 prod det/bfo, 6EB8 af1/af out, OA2 vr, zener htr reg, trans htr reg **ANT IN:** Phono jack, 50-75 Ω **AF OUT:** 8 Ω **REMARKS:** Kit. Separate power supply.

**MODEL:** MR-1 Comanche **YRS:** 1959-60 **PRICE:** $119.95 **BANDS:** 5 ham bands, 80-10 mtrs **IF:** 3000 kHz **FILTER:** Crystal lattice **TUBES:** 8, 6BZ6 rf, 6EA8 mix/hfo, 6BZ6 if1, 6EA8 if2/mtr amp, 6T8 det/agc/nl/af1, 6BE6 prod det/bfo, 6AQ5 af out, OA2 vr **ANT IN:** SO239, 52 Ω **AF OUT:** 8 Ω, 2 W. **REMARKS:** Kit. Separate power supply.

**MODEL:** RX-1 Mohawk **YRS:** 1958-63 **PRICE:** $274.95 **BANDS:** 7 ham bands, 160-10 mtrs **TYPE:** Double conversion, variable hfo **IF:** 1682, 50 kHz **FILTER:** 50 kHz L/C **TUBES:** 15, 6BZ6 rf, 6CS6 mix1, 12AT7 hfo/k fol, 6BA6 if, 6BE6 mix2, 12AT7 xco, 2 6BA6 if, 6BJ7 det/anl/avc, 6CS6 prod det/bfo, 12AT7 af1/mtr amp, 6AQ5 af out, 6BA6 calib, OA2 vr, 5V4 rect

## HEATH

**ANT IN:** SO239, 3 screw term, bal 50-72 Ω, unbal **AF OUT:** 2 W, 8/500 Ω 150-300 Ω **REMARKS:** Kit.



**MODEL:** SB-300 **YRS:** 1963-66 **PRICE:** $264.95 **BANDS:** 8 500 kHz bands, 80-10 mtrs **TYPE:** Double conversion, fixed hfo **IF:** 8400-8900, 3395 kHz **FILTER:** Crystal lattice **TUBES:** 10 + 6 semi diodes, 6BZ6 rf, 6AU6 mix1, 6AB4 xco, 6AU6 mix2, 6AU6 vfo, 2 6BA6 if, 6AS11 prod det/bfo/k fol, 6HF8 af1/af out, 6AU6 calib, CR3 det, 2 CR avc, 3 CR rect **ANT IN:** 50 Ω, phono jack **AF OUT:** 8/500 Ω, 1 W. **REMARKS:** Kit.

SB-301
HEATHKIT

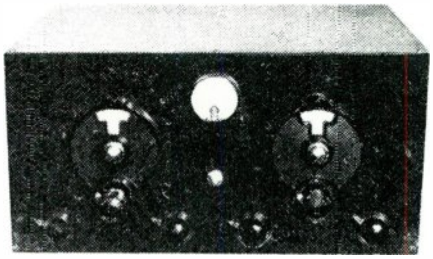
**MODEL:** SB-301 **YRS:** 1966-69 **PRICE:** $260 **BANDS:** 9 500 kHz bands, 80-10 mtrs + WWV **TYPE:** Double conversion, fixed hfo **IF:** 8395-8895, 3395 kHz **FILTER:** Crystal lattice **TUBES:** 10 + 8 semi diodes, 6BZ6 rf, 6AU6 mix1, 6AB4 xco, 6AU6 mix2, 6AU6 lmo, 2 6BA6 if, 6AS11 prod det/bfo/bfo amp, 6HF8 af1/af out, 6AU6 calib, CRdet, 2 CR avc, 2 CR anl, 3 CR rect **ANT IN:** 50 Ω, phono jack **AF OUT:** 1 W, 8 Ω spkr, hi z phones **REMARKS:** Kit. Changes from SB-300: RTTY position, 15-15.5 mHz range, switched anl, provision for 6 and 2 meter converters.

## HEATH

**MODEL:** SB-310 **YRS:** 1967-72 **PRICE:** $280 **BANDS:** 9 500 kHz bands, 3.5-30 mHz **TYPE:** Double conversion, fixed hfo **IF:** 8395-8895, 3395 kHz **FILTER:** Crystal lattice **TUBES:** 10 + 8 semi diodes, 6BZ6 rf, 6AU6 mix1, 6AB4 xco, 6AU6 mix2, 6CB6 vfo, 2 6BA6 if, 6AV11 prod det/bfo/af k fol, 6HF8 af1/af out, 6AU6 calib, 1N91 det, 2 IN458 agc, 2 S187 nl, 3 1N2079 rect **ANT IN:** 50 Ω, phono jack **AF OUT:** 1 W, 8 Ω **REMARKS:** Kit. SWL version of SB-301.

## HENDRICKS & HARVEY

Hendricks & Harvey was located at 408 Main Street, Hartford, Conn. They advertised a "built to order" single signal receiver in late 1932 and early 1933, shortly after James Lamb's articles on the crystal filter.



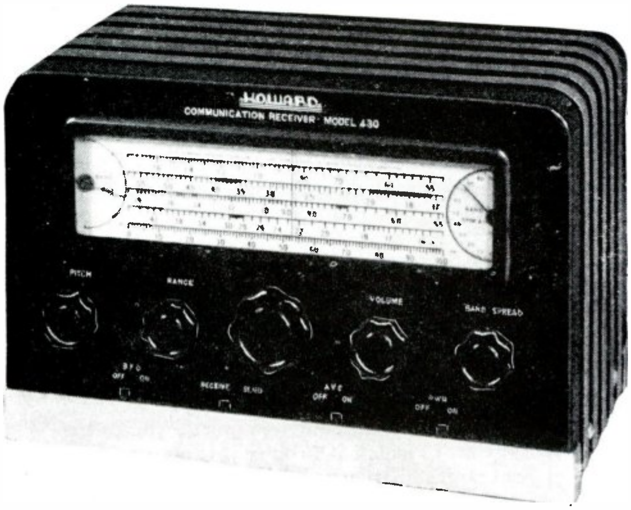
**MODEL:** Variation 1 **YRS:** 1932-33 **PRICE:** $225 **BANDS:** 4 **FILTER:** Crystal **TUBES:** 8 **REMARKS:** "Built to order." Separate power supply, plug-in coils.

**MODEL:** Variation 2 **YRS:** 1933 **PRICE:** $225 **BANDS:** 4 **FILTER:** Crystal **TUBES:** 9 including 1 rf, 2 if, det, bfo, 59 af out **REMARKS:** "Individually custom built." Plug-in coils, separate power supply, Adds agc, RF stage.

## HOWARD

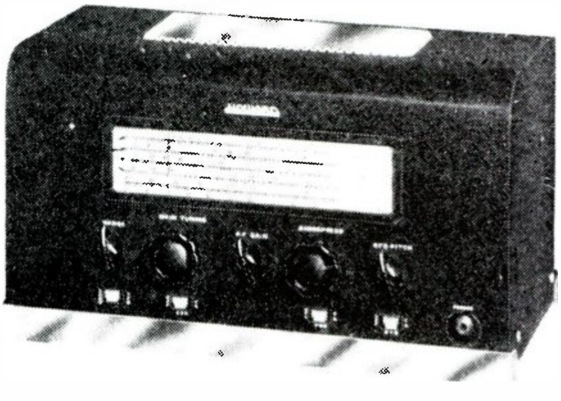
The Howard Radio Company of Belmont Avenue in Chicago, a long time manufacturer of broadcast receivers, offered a full line of communications receivers from 1938 to 1942. A full page ad in the 1946 ARRL Handbook promoted a post-war line of quality receivers but we believe they never did produce a post-war receiver.

During 1934 and 1935 Howard assembled receivers for Hallicrafters and McMurdo Silver who had no RCA licenses.



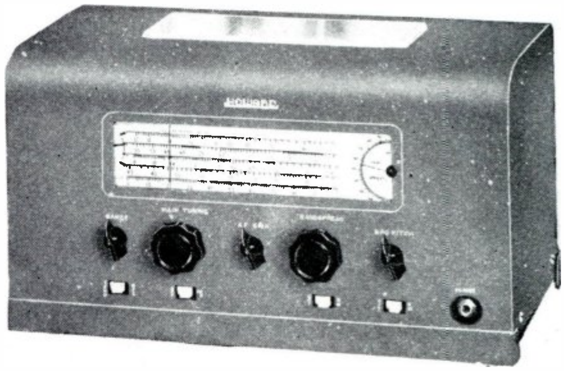
**MODEL:** 430 **YRS:** 1938 **PRICE:** $29.95 **BANDS:** 4, .54-40 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 6, 6K8 conv, 6K7 if, 6Q7 det/af1/avc, 6C5 bfo, 41 af out, 5W4 rect **ANT IN:** 3 screw term, A, D, G **AF OUT:** 2.5 W.

**MODEL:** 430 - Type 2 **YRS:** 1938-39 **PRICE:** $29.95 **REMARKS:** Same as previous model except has auxilliary socket for battery power supply and external "R" meter.

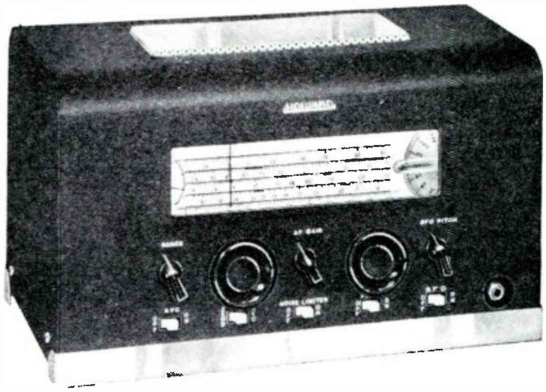


## HOWARD

**MODEL:** 435 **YRS:** 1940-41 **PRICE:** $29.95 **BANDS:** 4, .54-40 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 6, 6K8 conv, 6SK7 if, 6Q7 det/af1, 6C5 bfo, 6K6 af out, 5W4 rect, **ANT IN:** 3 screw, A, D, G **AF OUT:** 2.5 W **REMARKS:** Internal speaker.



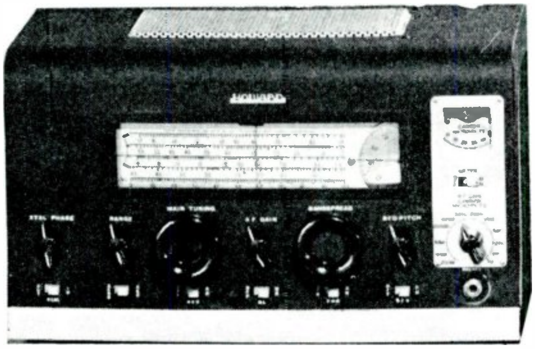
**MODEL:** 435-A **YRS:** 1941-42 **PRICE:** $36.75 + $12.00 "S" meter **BANDS:** 4, .55-43 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 7, 6SK7 rf, 6SA7 conv, 6SK7 if, 6SQ7 det/avc/af1, 6J5 bfo, 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, A, D, G **AF OUT:** 2.5 W. **REMARKS:** Internal speaker. Optional transformer for 110/117/140/230 V., 40 Hz and optional "S" meter.



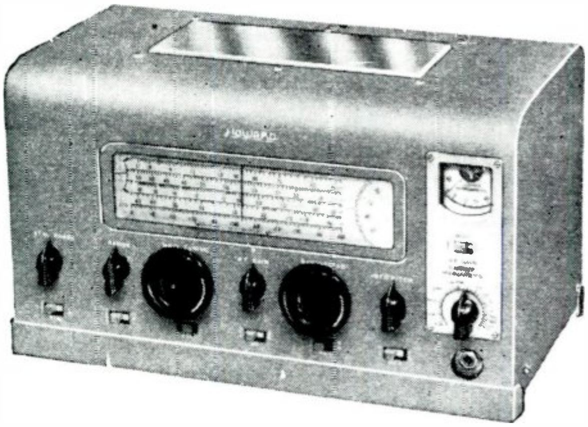
**MODEL:** 436 **YRS:** 1939-40 **PRICE:** $39.95 **BANDS:** 4, .54-43 mHz **TYPE:** **IF:** 465 kHz **FILTER:** None **TUBES:** 7, 6K8 conv, 6SK7 if, 6SQ7 det/af1, 6C5 bfo, 6H6 nl, 6K6 af out, 80 rect **ANT IN:** 3 screw term, A, D, G **AF OUT:** 2.5 W.

## HOWARD

**MODEL:** 436-A **YRS:** 1941-42 **PRICE:** $41.75 **BANDS:** 4, .54-43 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 8, 6SK7 rf, 6SA7 conv, 6SK7 if, 6SQ7 det/avc/af1, 6J5 bfo, 6K6 af out, 6H6 nl, 5Y3 rect **ANT IN:** 3 screw term, A, D, G **AF OUT:** 2.5 W. **REMARKS:** Internal speaker. Adds noise limiter to 435-A. Optional "S" meter available.

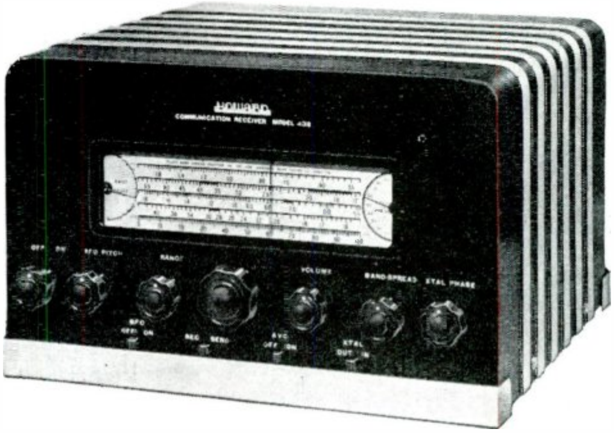


**MODEL:** 437 **YRS:** 1940 **PRICE:** $54.50, $62.50 with crystal **BANDS:** 4, .54-43 mHz **IF:** 465 kHz **FILTER:** Crystal (Optional) **TUBES:** 9, including 1 rf, 2 if stages.

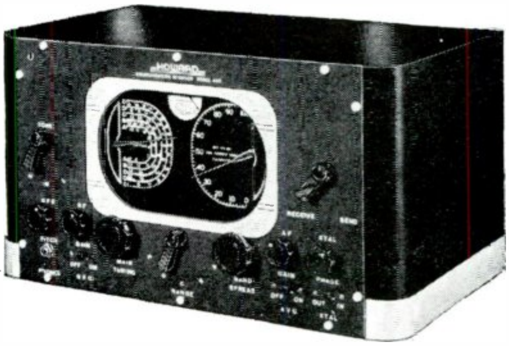


**MODEL:** 437-A **YRS:** 1941-42 **PRICE:** $61.95, $69.75 with crystal, $85.50 with meter **BANDS:** 4, .54-43 mHz **IF:** 465 kHz **FILTER:** Crystal (optional) **TUBES:** 9 **REMARKS:** Optional crystal and "S" meter.

## HOWARD



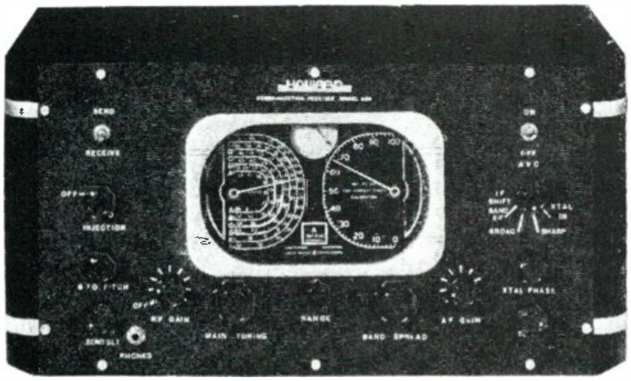
**MODEL:** 438 **YRS:** 1939 **PRICE:** $49.95 (less crystal) **BANDS:** 4, .54-43 mHz **IF:** 465 kHz **FILTER:** Crystal (optional) **TUBES:** 8, 6K7 rf, 6K8 conv, 2 6K7 if, 6Q7 det/avc/af1, 6C5 bfo, 41 af out, 80 rect **ANT IN:** 3 screw term, A, D, G **AF OUT:** 2.5 W. **REMARKS:** Internal 6" speaker. Optional crystal and "S" meter.



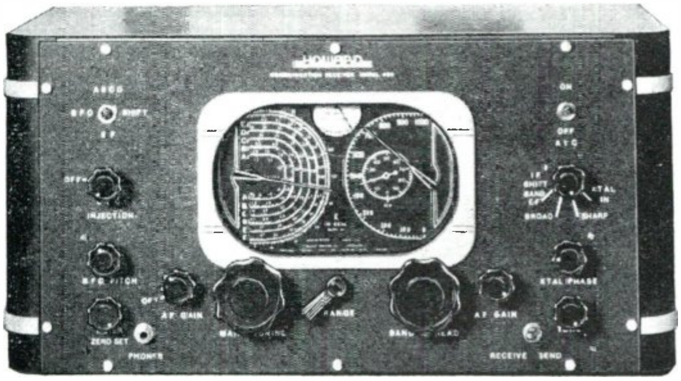
**MODEL:** 440 **YRS:** 1938-39 **PRICE:** $74.45, $84.45 with crystal **BANDS:** 5, .54-40 mHz **IF:** 465 kHz **FILTER:** Crystal (optional) **TUBES:** 9, 6K7 rf, 6K8 conv, 2 6K7 if, 6Q7 det/avc/af1, 6J7 bfo, 6J5 mtr amp, 6V6 af out, 80 rect **ANT IN:** 3 screw term, A, D, G **AF OUT:** 4.5 W.

**MODEL:** 445 **YRS:** 1941-42 **PRICE:** $36.75 **BANDS:** 4, .55-43 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 6 **REMARKS:** Internal speaker. AC/DC power supply. Same as 435-A except AC/DC.

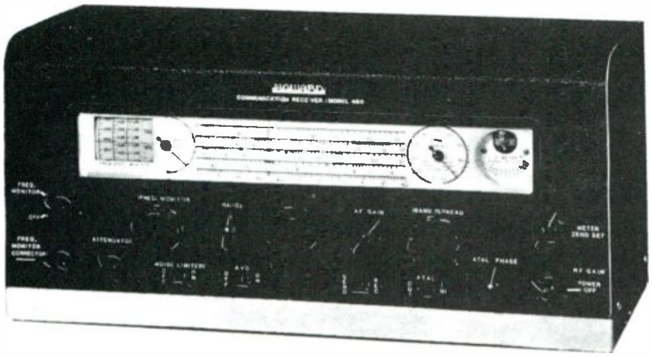
## HOWARD



**MODEL:** 450 **YRS:** 1938 **PRICE:** $87.50 + $10 xtal **BANDS:** 6, .54-65 mHz **IF:** 1560 kHz band 6, 455 kHz **TUBES:** 12 **ANT IN:** 3 screw term, A, D, G, separate term bands E & F **AF OUT:** 8 W **REMARKS:** RF amplifier not used on band 6.

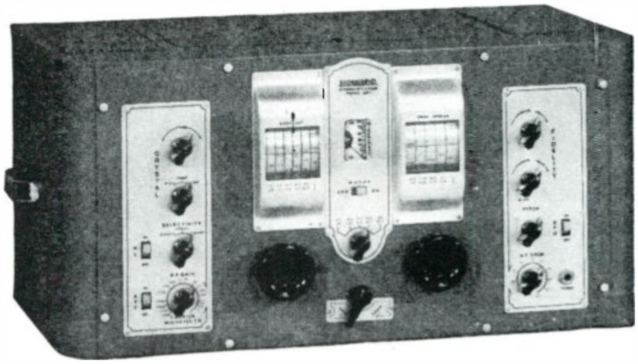


**MODEL:** 450-A **YRS:** 1938-39 **PRICE:** $95.45, $105.45 with crystal **BANDS:** 6, .55-65 mHz **IF:** 1560 kHz band 6, 465 kHz bands 1-5 **FILTER:** Crystal (optional) **TUBES:** 12, 6K7 rf, 6L7 mix, 6J6 hfo, 2 6K7 if, 6Q7 det/af1, 6J7 bfo, 6J5 meter amp, 6J5 af inv, 2 6V6 af out, 80 rect **ANT IN:** 3 screw term, A, D, G, separate term for bands E & F **AF OUT:** 9.5 W, 5/500 Ω **REMARKS:** RF amplifier not used on band 6.



## HOWARD

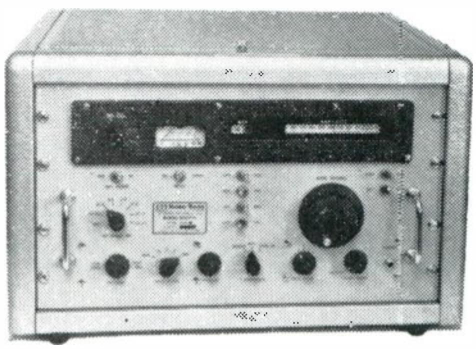
**MODEL:** 460 **YRS:** 1939-40 **PRICE:** $79.95, $89.95 with crystal **BANDS:** 4, .54-43 mHz **IF:** 465 kHz **FILTER:** Crystal (optional) **TUBES:** 10, 6K6 monitor, 6SK7 rf, 6K8 conv, 6SF5 meter amp, 2 6SK7 if, 6SQ7 det/af1, 6N6 nl, 6V6 af out, 80 rect **ANT IN:** 3 screw term, A, D, G **AF OUT:** 4 W, 5 Ω **REMARKS:** Built-in frequency monitor.



**MODEL:** 490 **YRS:** 1940-42 **PRICE:** $149.50 **BANDS:** 6, .54-30 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 14, 2 6AB7(1853) rf, 6SA7 mix, 6SA7 hfo, 2 6SK7 if, 6H6 det/avc/nl, 6SF5 af1, 6J5 phase inv, 6J5 bfo, 7E7 meter amp, 2 6K6 af out, 5Y3 rect **ANT IN:** 3 screw term, A, D, G **AF OUT:** 8 W, 5/500 Ω

## ITT MACKAY MARINE

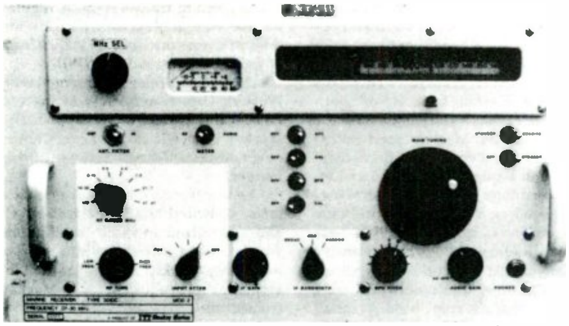
Mackay Marine is an old manufacturer of marine communications systems and they continue in business today with a respected line of solid state gear. They made a number of vacuum tube communications receivers which were not usually available to the public. In the 1960's they did try to sell one of their models to the amateur market.



From April, 1967, *QST*, courtesy ARRL

## ITT MACKAY MARINE

**MODEL:** 3010-B **YRS:** 1962-69 **PRICE:** $1600 **BANDS:** 15 2 mHz bands, .07-30 mHz **TYPE:** Triple conversion, fixed hfo, up conversion **IF:** 37-39 mHz, 5940, 455 kHz **FILTER:** Mechanical **TUBES:** 17 + 8 semi diodes, 7788 rf, 6C4 k fol, 4 1N82A mix1, 6BL8 xco/k fol, 6688 if, 6BL8 k fol/mix2. 6BA6 vfo, 6U8 xco/premix, 6EW6 inj amp, 6BE6 mix3/xco, 2 6BA6 if, 12AT7 prod det, 6AU6 bfo, 6AV6 det/avc/af1, 6BF5 af out, 6BA6 calib, OB2 vr, 2 CR anl, 2 CR rect **ANT IN:** SO239, 75 Ω **AF OUT:** 1 W, 4/600 Ω

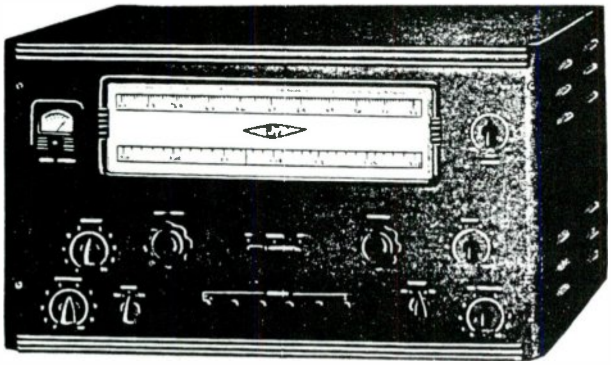


Courtesy Ray Osterwald and *Electric Radio*

**MODEL:** 3010-C **YRS:** 1969-70 **REMARKS:** Same as 3010-B with minor changes and options.

## JEFFERSON-TRAVIS

Jefferson-Travis Radio Manufacturing Corp., a manufacturer of two-way radio equipment, was located on East 23rd Street in New York. They had a two page advertisement in the 1945 ARRL Handbook announcing a new general coverage receiver. Nothing more is known about this receiver.



**MODEL:** CR-1 **YRS:** 1945 **BANDS:** 5, .54-32 mHz **FILTER:** Crystal **TUBES:**15, includes 2 rf and p/p af out **AF OUT:** 10 W

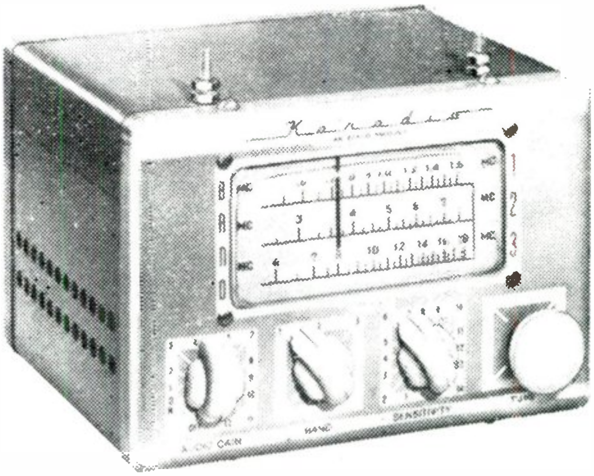
## KAAR ENGINEERING

Kaar Engineering Co, founded by John Kaar, was located in Palo Alto, CA.

**MODEL:** KE-23A **YRS:** c. 1944 **BANDS:** 4, 0.5-42 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6SK7 rf, 6K8 conv, 6SK7 if, 6H6 anl, 6SQ7 det/sq/avc, 6SQ7 af1, 6SK7 bfo, 6V6 af out, 5Y3 rect **ANT IN:** 3 screw term, A, D, G, 400 Ω **AF OUT:** 4/500 Ω, 2 W. **REMARKS:** No filter, "S" meter. Has electrical bandspread.

**MODEL:** KE-23AT **YRS:** c. 1944 **REMARKS:** Has universal power transformer 100/120/150/210/230 V., 40-60 Hz. Also includes "S" meter and mechanical bandspread.

## KARADIO



**MODEL:** 80-C **YRS:** 1952 **BANDS:** .54-17.5 mHz **FILTER:** None **TUBES:** 6, 6BA6 rf, 6BE6 conv, 6BA6 if, 6AT6 det/af1, 6AQ5 af out, 6X5 rect **REMARKS:** Mobile-type receiver. Separate vibrator power supply.

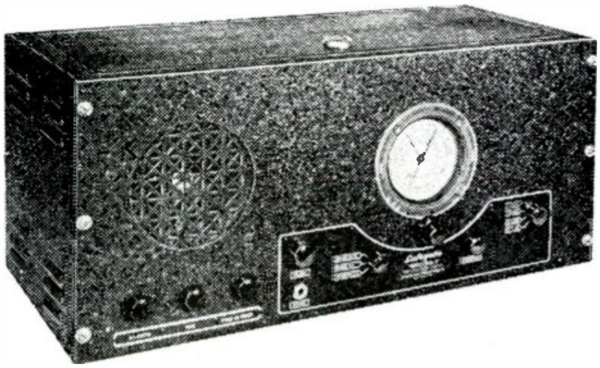
## KNIGHT

The Knight name was used by Allied Radio (q.v.) for their house brand equipment.

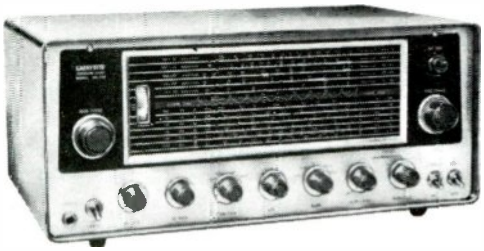
## LAFAYETTE

Wholesale Lafayette, a New York based distributor, began offering communications receivers in the mid-1930's and continued to offer them through the late 1970's as Lafayette Radio.

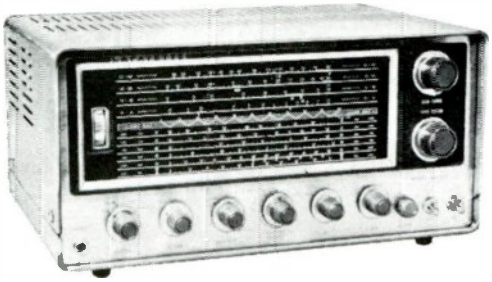
## LAFAYETTE



**MODEL:** Professional 9 **YRS:** 1935-36 **PRICE:** $36.75 kit, $44.25 wired **BANDS:** 4, .55-30 mHz **IF:** 470 kHz **FILTER:** None **TUBES:** 9, 6D6 rf, 6C6 mix, 41 hfo, 6D6 if, 6B7 det/avc/if2, 76 bfo, 6C6 af1, 42 af out, 80 rect **ANT IN:** 2 screw term, unbal **REMARKS:** Kit or assembled. Preassembled tuning unit, airplane dial, internal speaker.

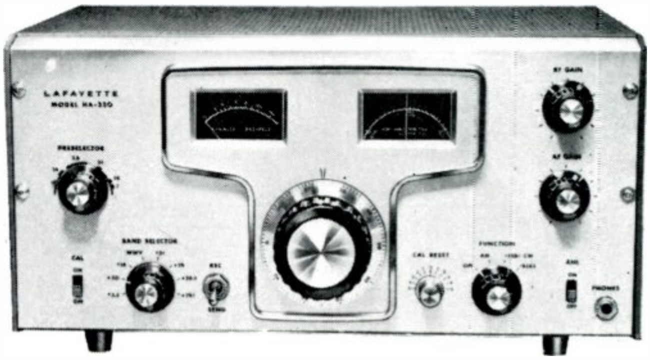


**MODEL:** HA-225 **YRS:** 1966 **PRICE:** $129.95 **BANDS:** 5, .15-54 mHz **IF:** 455 kHz **TUBES:** 14



**MODEL:** HA-230 (KT-340) **YRS:** 1965-66 **PRICE:** $74.50 kit, $89.50 wired **BANDS:** 4, .55-30 mHz **IF:** 455 kHz **FILTER:** Q-multiplier **TUBES:** 8 **AF OUT:** 1.3 W. **REMARKS:** Kit or assembled. Imported.

## LAFAYETTE

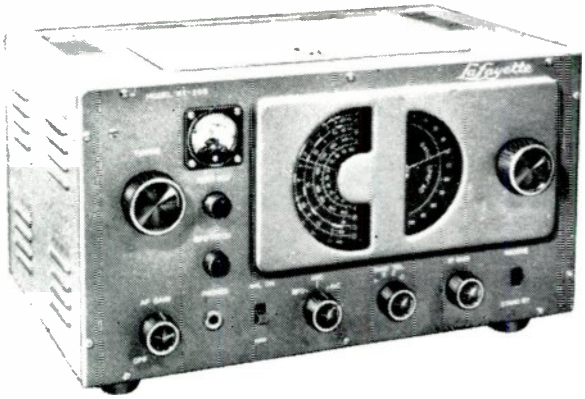


**MODEL:** HA-350 **YRS:** 1964-67 **PRICE:** $189.50 **BANDS:** 7 600 kHz ham bands (80-10 mtrs) plus WWV **TYPE:** Double conversion, fixed hfo **IF:** 3500-4000, 455 kHz **FILTER:** Mechanical **TUBES:** 12 + 3 semi diodes, 6BZ6 rf, 6BL8 mix1/xco, 6BE6 mix2, 6BA6 vfo, 2 6BA6 if, 1N60 det, 6AL5 avc/anl, 6AQ8 prod det/calib, 6BA6 bfo, 6AV6 af1, 6AQ5 af out, OB2 vr, 2 CR rect **ANT IN:** SO239 **AF OUT:** 1 W, 8/500 Ω **REMARKS:** Imported.

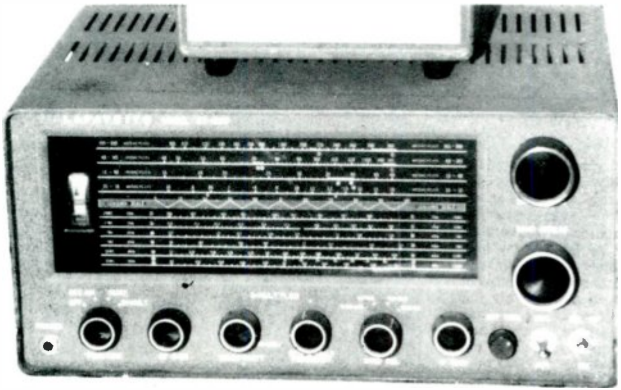
**MODEL:** HA-500 **YRS:** 1966 **PRICE:** $149.95 **BANDS:** 6, 80-10 meters **IF:** 2608, 455 kHz **FILTER:** Mechanical **TUBES:** 10.

**MODEL:** HA-700 **YRS:** 1966 **PRICE:** $89.95 **BANDS:** 5, .15-.4, .55-30 mHz **IF:** 455 kHz **FILTER:** Mechanical **TUBES:** 6 + 7 semi diodes, 6BA6 rf, 6BL8 mix/hfo, 2 6BA6 if, 6AQ8 prod det/bfo, 6BM8 af1/af out, 2 1N60 avc, 1N60 det, 1N60 mtr rect, SW-05S anl, 2 FR-1K rect **AF OUT:** 1.3 W, 4/8 Ω

## LAFAYETTE

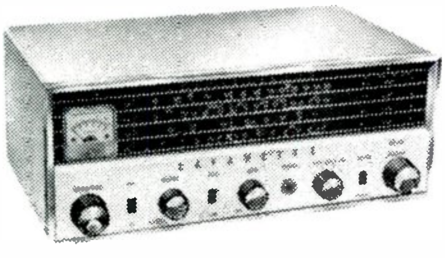


**MODEL:** HE-10 (KT-200WX) **YRS:** 1959-63 **PRICE:** $64.50 kit, $79.95 assembled **BANDS:** 4, .55-31 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6BD6 rf, 6BE6 mix, 6BE6 hfo, 2 6BD6 if, 6AV6 det/avc/af1, 6AV6 bfo/nl, 6AR5 af out, 5Y3 rect **ANT IN:** 3 screw term **AF OUT:** 1.5 W, 4/8 Ω **REMARKS:** Kit or assembled. Imported.



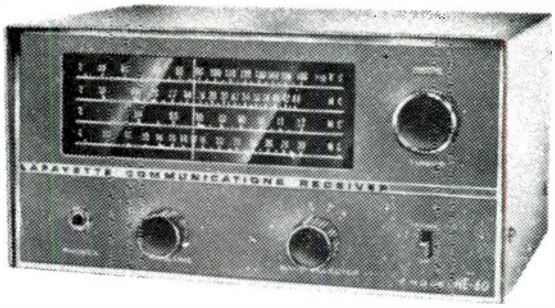
Courtesy Robert Oberholtzer and *Antique Radio Classified*

**MODEL:** HE-30 (KT-320) **YRS:** 1961-64 **PRICE:** $64.95 kit, $79.95 assemblied **BANDS:** 4, .55-30 mHz **IF:** 455 kHz **FILTER:** Q-multiplier **TUBES:** 9, 6BA6 rf, 6BE6 mix, 6BE6 hfo, 6AV6 q-mult/bfo, 2 6BA6 if, 6AV6 det/anl,af1, 6AQ5 af out, 5Y3 rect **ANT IN:** Term, A, A, G **AF OUT:** 1.5 W, 4/8 Ω **REMARKS:** Imported.

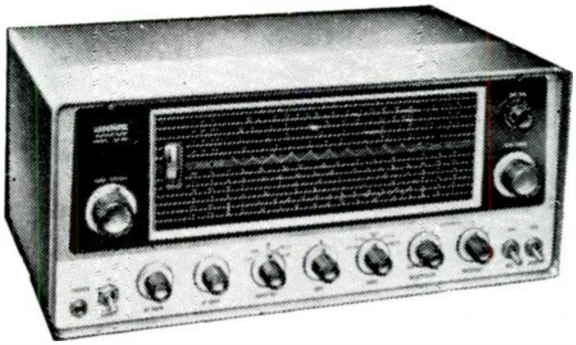


## LAFAYETTE

**MODEL:** HE-40 **YRS:** 1961-63 **PRICE:** $54.50 **BANDS:** .55-30 mHz **ANT IN:** Ferrite loop band 1, whip bands 2-4 **REMARKS:** Internal speaker.



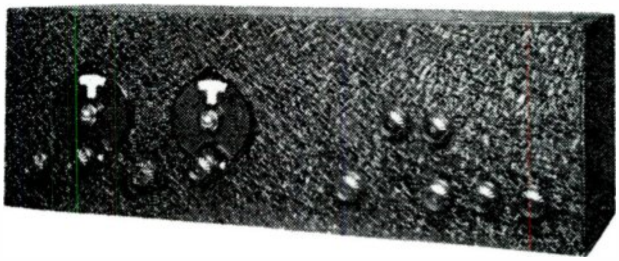
**MODEL:** HE-60 **YRS:** c. 1962 **PRICE:** $39.95 **BANDS:** 4, .55-30 mHz **FILTER:** None **TUBES:** 3 + semi diode **REMARKS:** Internal speaker.



**MODEL:** HE-80WX **YRS:** 1963-64 **PRICE:** $149 **BANDS:** 5, .55-54 mHz **TYPE:** Single conversion, except dual conversion on 6 mtrs **IF:** ?, 455 kHz **FILTER:** Q multiplier **TUBES:** 15 + 1 semi diode, 6AQ8 6 mtr rf, 6AQ8 6 mtr conv, 6BA6 rf, 6BE6 mix, 6AQ8 hfo/buff, 2 6BA6 if, 6AL5 det/anl, 6BE6 prod det, 6AQ8 af1/bfo, 6AQ5 af out, 6AQ8 q mult/calib, 6CA4 rect, OA2 vr, 1N60 calib **AF OUT:** 1.5 W, 8 Ω **REMARKS:** Import.

## LEEDS

Leeds was a radio distributor on Versey Street in New York City.

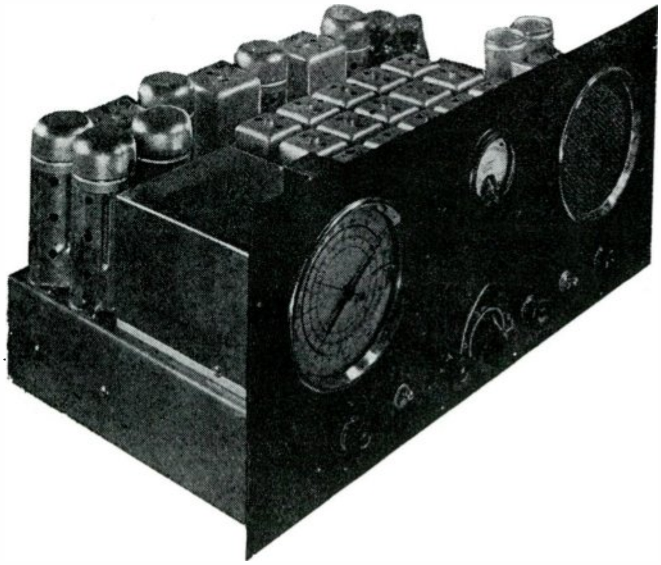


## LEEDS

**MODEL:** Supreme **YRS:** 1933 **PRICE:** $95 **BANDS:** 5, 1.5-20 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 9, 58 rf, 58 mix, 24A hfo, 2 58 if, 55 det/avc, 56 bfo, 247 af out, 80 rect **REMARKS:** Kit. Uses National ham bandspread or general coverage coils.

## LINCOLN

Lincoln Radio Corp., Chicago, was a manufacturer of high-end, custom broadcast receivers that competed with E. H. Scott and McMurdo Silver. William H. Hollister was president and chief engineer. Hollister was also a ham and in 1933 introduced the R-9, one of the early communications receivers.



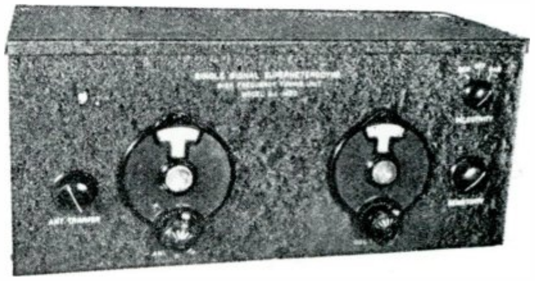
**MODEL:** CQ **YRS:** 1934-35 **BANDS:** 5 **TUBES:** 8, including 1 rf, 2 if **REMARKS:** Kit.

## LINCOLN

**MODEL:** R-9 **YRS:** 1933 **BANDS:** 5. 1.5-33 mHz **IF:** 175 kHz **FILTER:** None **TUBES:** 11, 58 mix, 56 hfo, 3 58 if, 6P Wunderlich det/avc, 56 af1, 56 bfo, 2 45 p/p af out, 80 rect **REMARKS:** Tuning meter, separate power supply.

## M & H SPORTING GOODS

M & H Sporting Goods Co., 512 Market St, Philadelphia, was a prominent distributor of components and equipment in the 1930's and sometimes sold equipment under their own name. Shortly after James Lamb described the single signal superheterodyne in *QST*, M & H offered a single signal receiver, assembled but unwired, based on Lamb's design. The set was the work of Don Lusk, W3ZF/W3CGI, and was featured in the November, 1932, *QST*.



**MODEL:** Single Signal Superheterodyne **YRS:** 1932-33 **PRICE:** HF Tuner Unit $90.75, IF/AFUnit $57 **BANDS:** 3, 20, 40, 80 mtrs **IF:** 525 kHz **FILTER:** Crystal **TUBES:** HF Tuner 4, 58 rf, 58 mix, 24 hfo, 58 if, IF/AF Unit 5, 2 58 if, 56 det, 24 bfo, 46 af out **REMARKS:** Kit assembled but unwired. Separate power supply and IF/audio units. Photo shows HF tuner unit only.

## McCULLA

In 1934 McCulla Mfg Co, Waukegan, IL, (formerly National Pfanstiehl Radio Corp) manufactured and advertised the "Pfanstiehl Single Side Band Superheterodyne Communication Receiver."

## McCULLA

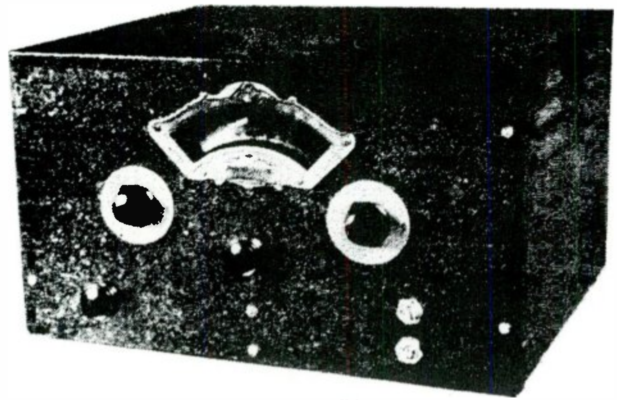


Photo courtesy Eugene Rippen

**MODEL:** 50 A/X **PRICE:** $29.12, $41.70(x) **BANDS:** .135-35 mHz (1-21 mHz std) **FILTER:** xtal (optional) **IF:** 456 kHz **TUBES:** 6, 2 2A7, 2 58, 59 af out, 80 rect **ANT IN:** bal/unbal **AF OUT:** 3 W. **REMARKS:** Plug-in coils, separate power supply. Amateur model. Designed by W9AE.

**MODEL:** 50 BC **PRICE:** $29 **FILTER:** None **IF:** 456 kHz **REMARKS:** AM reception only with AVC, no BFO. Plug-in coils, separate power supply.

Photo courtesy Doug Lyon

**MODEL:** 70A/X Pfanstiehl Super **YRS:** 1934 **PRICE:** $34.95, $46.71 w/xtal **BANDS:** 6, 1.05-21 mHz **FILTER:** Crystal (optional) **TUBES:** 8, 57 mix, 58 bfo, 2 58 if, 2B7 det/avc/af1, 58 bfo, 59 af out, 80 rect **ANT IN:** bal/unbal **AF OUT:** 3 W. **REMARKS:** Plug-in coils, separate power supply with 80 rect. Supplied with 4 sets of coils for 20, 40, 80, 160 mtrs. Air tuned IF transformers optional extra.

**MODEL:** 70AB/X **TUBES:** 7, 77 mix, 78 hfo, 2 78 if, 6B7 det/avc/af1, 78 bfo, 41 af out **REMARKS:** Battery version of 70A.

## McMURDO SILVER INC.

McMurdo Silver started his first company. Silver-Marshall, in 1924 at the age of 21. The original location was a 1600 sq. ft. loft over a garage in Evanston, IL. By 1929 S-M moved into a 106,000 sq. ft. plant at 6401 W. 65th St., Chicago. They manufactured components, audio transformers, variable capacitors, coils, sockets, dials, speakers, and by 1928 claimed 10% of the U. S. parts business. In addition, S-M manufactured a line of home BC receivers and a number of all-wave regenerative receivers.

Silver-Marshall declared bankruptcy in October, 1932, during the depths of the depression,and Silver immediately formed a new company, McMurdo Silver Inc., to manufacture custom, all-wave receivers which competed at the top on the line with E. H. Scott and Lincoln Radio.

The firm started at 1136 W. Austin Ave, Chicago, moved to 1747 Belmont St. in 1933, to 3358 N. Paulina St. in 1934 and, finally, to 2900 S.Michigan Blvd in 1936. Silver manufactured his own sets until a suit by RCA halted production in 1934. Howard Radio (q.v.) manufactured the Silver receivers from April, 1934, to late 1935 when Silver received an RCA license and resumed production.

The mainstay of the Silver line was the Masterpiece receiver which was updated annually and culminated in 1937 with the Masterpiece VI. The advertising for the receivers was as gaudy as the chrome plated sets themselves. In 1937 as E. H. Scott was proclaiming his 31 tube Philharmonic XXX to be the "World's Most Powerful Radio" Silver touted the Masterpiece VI as the "Finest Receiver Ever Built."

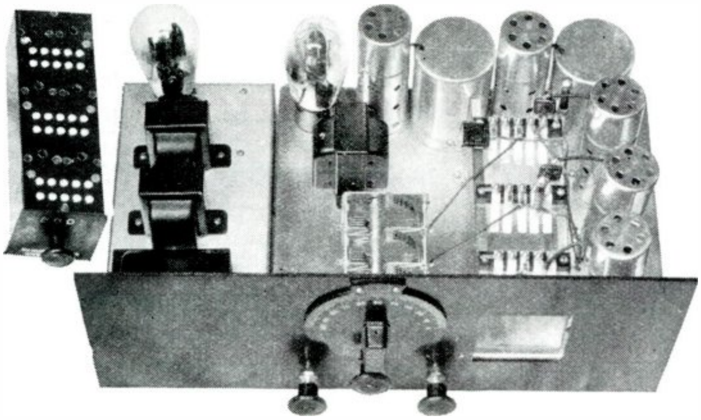
McMurdo Silver was a prolific writer who promoted his products by authoring dozens of articles in the radio magazines of the 1920's, 1930's and 1940's. As an advertising promotion Admiral Byrd carried a Masterpiece II on his 1933-34 Antarctic expedition. Another widely advertised promotion in late 1934 was a DX listening contest in Hollywood between Bing Crosby

## McMURDO SILVER INC

and Richard Arlen, each using a Masterpiece III.

The company became the McMurdo Silver Corp., Division of GPH, Inc, in May, 1935, with the purchase of a controlling interest in the company by Glen's Patents & Holdings of England. Silver became chief engineer.

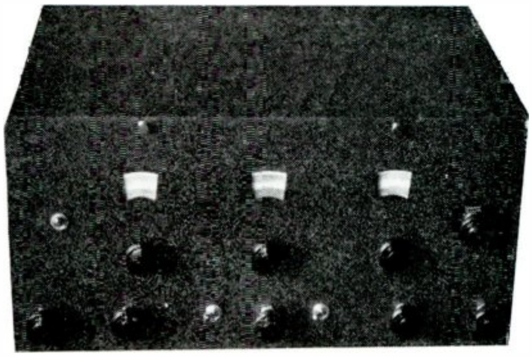
McMurdo Silver, Inc, closed its doors in 1938 due to poor sales. Its assets were purchased by rival E. H. Scott in November, 1938. A British offshoot, British McMurdo Silver, Ltd, continued on into 1939 before closing down also. Silver moved on to E. I. Guthman (q.v.) as an engineer and designed a unique receiver and a line of ham accessories. After Guthman closed their equipment line in 1940 Silver spent the war years working for Lear, Fada and Grenby Mfg. In 1945 he formed his last company, McMurdo Silver Co, Inc, (q.v.) in Hartford, CT, to manufacture a line of test equipment and some simple ham gear. McMurdo Silver died in 1948 at the age of 45.



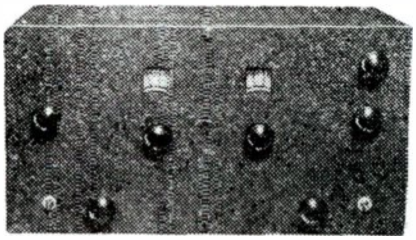
**MODEL:** 3A Ham Super **YRS:** 1933 **BANDS:** 4, 1.5-20 mHz **FILTER:** Regeneration **TUBES:** 7, rf, mix, hfo, if, det, af out, rect **REMARKS:** Three gang plug-in coils, regeneration. Silver applied for patent on ganged coil system in 1934, granted in 1936. Partial insertion gives bandspread on ham bands, full insertion for general coverage. Same system used by Postal, similar system in HRO. Receiver "designed by Fred Schnell Robert Kruse and McMurdo Silver."

## McMURDO SILVER INC

**MODEL:** 3A Ham Super (Variation) **TUBES:** 6 **REMARKS:** Battery operated version.



**MODEL:** 5A Silver Single Signal Super **YRS:** 1933 **BANDS:** 4, 1.5-25 mHz **FILTER:** Crystal **TUBES:** Includes 2A7 det/agc **REMARKS:** Three dials, bandswitching, agc. "For a communications receiver, Admiral Byrd chooses the Silver 5A..."



**MODEL:** 5B **YRS:** 1934 **PRICE:** $59.70 **BANDS:** 3, 1.55-30 mHz **IF:** 465 kHz **FILTER:** Crystal (optional) **TUBES:** 8, 58 rf, 2A7 conv, 2 58 if, 56 det/af1, 58 bfo, 59 af out, 5Z3 rect **ANT IN:** 3 term, bal/unbal **AF OUT:** 3 W. **REMARKS:** Bandswitching.

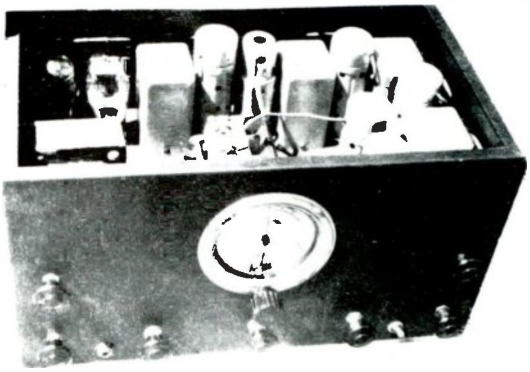
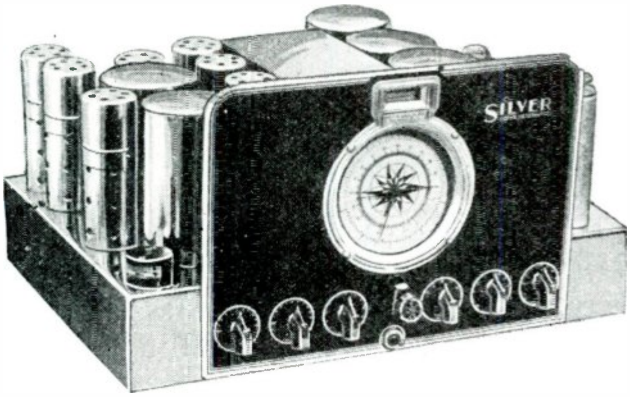


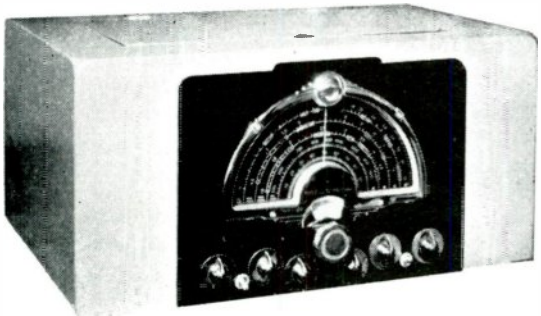
Photo courtesy *Old Timers Bulletin and Bill Fizette*

## McMURDO SILVER INC

**MODEL:** 5C Single Signal Super **YRS:** 1934-35 **PRICE:** $74.70, $83.50 with crystal **BANDS:** 3, 1.5-23 mHz **IF:** 465 kHz **FILTER:** Crystal (optional) **TUBES:** 8, 58 rf, 2A7 conv, 2 58 if, 55 det/avc/af1, 2A5 af out, 58 bfo, 80 rect **ANT IN:** 3 term, bal/unbal **AF OUT:** 3 W.

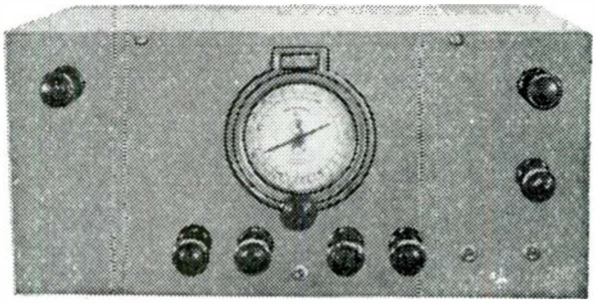


**MODEL:** 5D Radio Silver **YRS:** 1935-36 **PRICE:** $109.80 **BANDS:** 4, 1.7-33 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 10, 2 6D6 rf, 6D6 mix, 76 hfo, 6D6 if amp, 6C6 det, 6B7 avc amp, 76 bfo, 42 af out, 5Z3 rect **ANT IN:** 3 term bal/unbal **AF OUT:** 3 W. **REMARKS:** Kit sponsored by several components manufacturers. Designed by McMurdo Silver and Frank C Jones.

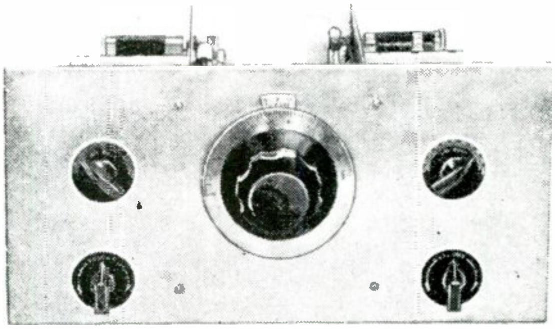


**MODEL:** 14-15 **YRS:** 1938 **PRICE:** **BANDS:** 4, .54-32 mHz **IF:** 472 kHz **FILTER:** L/C **TUBES:** 14 or 15, 6K7 rf, 6L7 mix, 6J7 hfo, 2 6K7 if, 6J5 det, 6K7 avc amp, 6H6 avc rect/eye rect, 6G5 eye, 6J5 bfo, 6J5 af1, 2 6L6 p/p af out, (2) 5Z3 rect **ANT IN:** 3 term bal/unbal **AF OUT:** 20 W **REMARKS:** Regenerative RF amplifier, one 5Z3 used for 10" spkr model, two 5Z3 used for 15" model.

## McMURDO SILVER INC



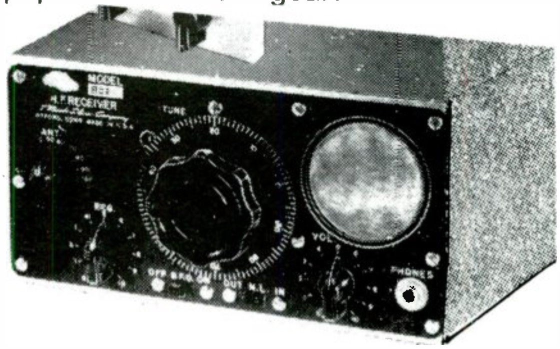
**MODEL:** Masterpiece III-X **YRS:** 1934-35 **FILTER:** Single crystal for CW, dual crystals 700 Hz apart for phone **IF:** 465 kHz **TUBES:** 12, 58 rf, 2A7 conv, 3 58 if, 56 det, 56 avc, 58 bfo, 2A5 af1, 2 2A5 p/p af out, 5Z3 rect **ANT IN:** 3 term, bal/unbal **AF OUT:** 18 W **REMARKS:** Communications version of Masterpiece III. First use of crystal lattice filter?



**MODEL:** Super Gainer **YRS:** 1935-36 **PRICE:** $23.40 **BANDS:** 5, 10-160 mtr ham bands **IF:** 465 kHz **FILTER:** Regen 2nd det **TUBES:** 3, 6C6 regen mix, 76 hfo, 79 regen det/af **ANT IN:** unbal **REMARKS:** Plug-in coils, separate P/S. Designed by Silver and Frank C Jones.

## McMURDO SILVER CO

McMurdo Silver, Co, Inc, 1240 Main St, Hartford, Conn, was McMurdo Silver's last venture before his death at the age of 45 in 1948. The company manufactured test equipment and ham gear.

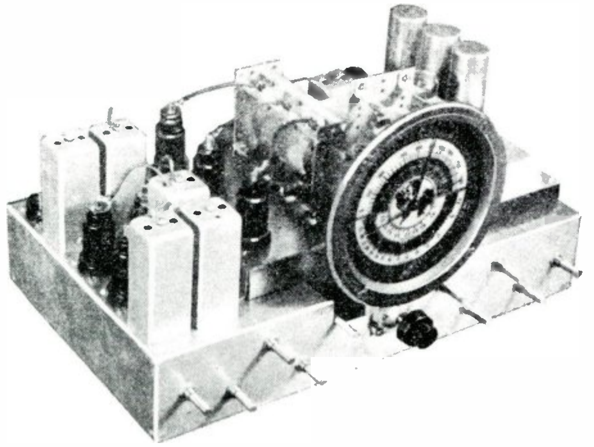


## McMURDO SILVER CO

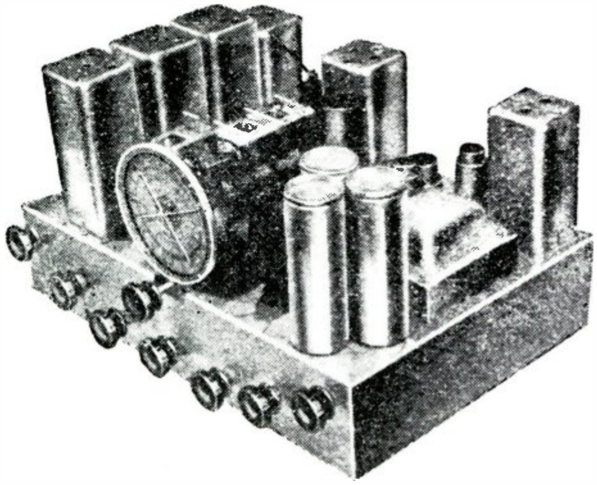
**MODEL:** 802 **YRS:** 1947-48 **PRICE:** $38.95 plus tubes, power supply and coils **BANDS:** 6, ham bands 80-6 mtrs **IF:** 735 kHz **FILTER:** Regenerative IF **TUBES:** 5, 6BE6 conv, 6BA6 if, 6J6 det/nl, 6J6 af1/bfo, 6AK6 af out **REMARKS:** Similar to ARRL Handbook design. Plug-in coils, internal speaker, separate power supply.

## MEISSNER

The Meissner Manufacturing Co, located in Mt. Carmel, IL, manufactured coils and transformers. During the later half of the 1930's they also sold various kit equipment utilizing a maximum number of their inductive components.

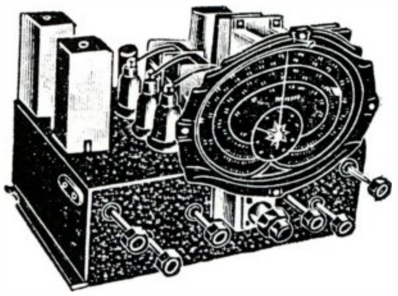


**MODEL:** 14-5 Communication 14 **YRS:** 1937-38 **BANDS:** 5, .55-60 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 14, 6K7 rf, 6L7 mix, 6J7 hfo, 6K7 if, 6L7 if, 6R7 det/af1, 6C5 bfo, 6S7 noise amp, 6H6 noise rect, 6K7 avc amp, 6H6 avc rect, 2 6L6 af out, 5Z3 rect **AF OUT:** 12 W. **REMARKS:** Kit.

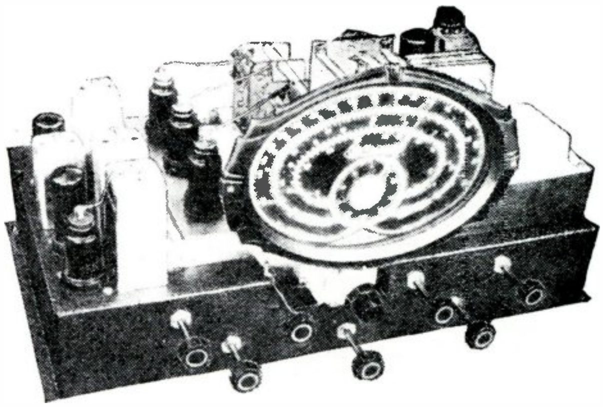


## MEISSNER

**MODEL:** Dejong "8" **YRS:** 1935-36 **BANDS:** 4, .54-25 mHz **TUBES:** 8 **REMARKS:** Kit.



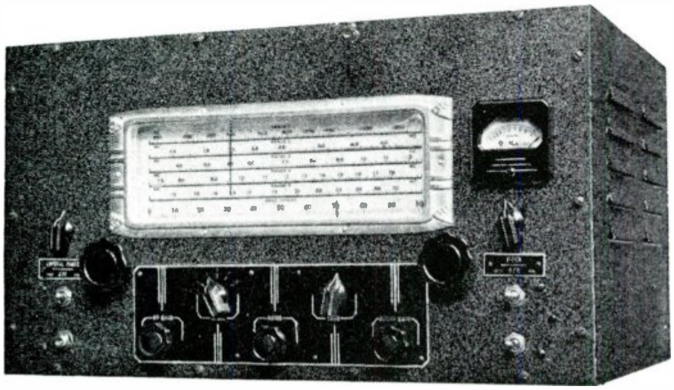
**MODEL:** All Wave "8" **YRS:** 1937-38 **PRICE:** $20.70 **BANDS:** 4, .54-43 mHz **REMARKS:** Kit with factory wired tuning assembly.



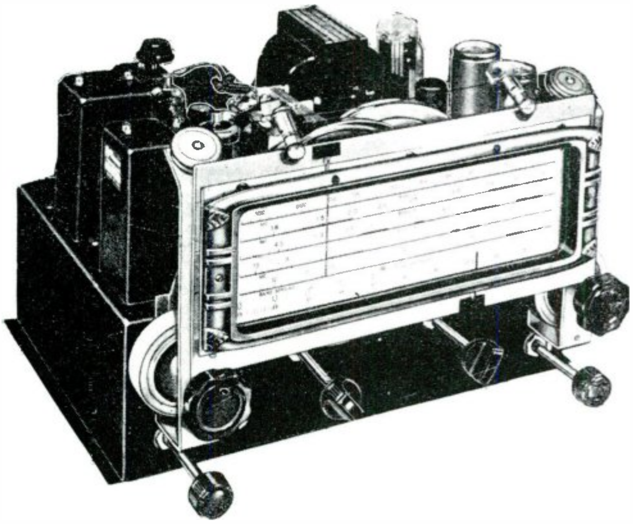
**MODEL:** All Wave "12" **YRS:** 1937 **BANDS:** 5, .55-60 mHz **IF:** 456 kHz **FILTER:** 456 kHz 3 position band-expanding IF xfmrs **TUBES:** 12, 6K7 rf, 6L7 mix, 6J7 hfo, 6K7 if1, 6L7 if2/silencer, 6J7 noise amp, 6H6 noise rect, 6R7 det/avc/af1, 6C5 bfo, 2 6L6 p/p af out, 5Z3 rect **ANT IN:** 2 term, A, G **AF OUT:** 12 W. **REMARKS:** Prewired tuning assembly. Kit.

**MODEL:** All Wave "12" (Variation) **BANDS:** 5, .14-43 mHz **REMARKS:** Long wave model, uses 410 pf (vs260 pf) main tuning capacitor.

## MEISSNER



**MODEL:** Traffic Master **YRS:** 1938-43 **PRICE:** $81.90 less tubes and speaker **BANDS:** 5, .54-31 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 14, 1853 rf, 6K8 mix, 6J7 hfo, 6L7 if1, 6K7 if2, 6H6 det/avc, 6H6 noise rect, 6J7 noise amp, 6SK7 (or 6SJ7) bfo, 6C8 phase inv, 2 6V6 p/p af out, VR150 vr, 5Y4 rect **ANT IN:** 3 screw term, A, D, G, 400 Ω **AF OUT:** 8.5 W. **REMARKS:** Kit with preassembled, wired tuning unit.



**MODEL:** Traffic Scout **YRS:** 1938-39 **BANDS:** 5, .54-31 mHz **FILTER:** None **TUBES:** 8, including one rf, one if **ANT IN:** 3 screw term, A, D, G **REMARKS:** Kit with preassembled, wired tuning unit.

## MEISSNER

**MODEL:** Traffic Scout **YRS:** 1940-43 **BANDS:** 5, .54-32.4 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 9, 1853 rf, 6K8 mix, 6J7 hfo, 2 6K7 if, 6Q7 det/avc/af1, 6SJ7 bfo, 6V6 af out, 5Y4 rect **ANT IN:** 3 screw term, A, D, G, 400 Ω **AF OUT:** 4.5 W. **REMARKS:** Kit with preassembled, wired tuning unit.

## MILITARY

There are a large number of military receivers meeting the guidelines of this book which were available on the surplus market and widely used by amateurs. Almost 70 of them are listed under Collins, Hallicrafters, Hammarlund, National, RCA, and TMC. These were variations of commercial designs or were associated with a particular company due to design features unique to that company. For example, the R-390A is listed under Collins for its permeability tuning, tunable IF and limited range VFO. Even though designed by Collins, many (most) R-390's were built by other companies.

There is a second group of military communications receivers which were not previously included and should have been. These were general coverage receivers designed for specific services and specific applications. They were common on the surplus market and used in many amateur stations. The BC-224, later the BC-348, was designed for long range aircraft communications. The BC-312 and BC-342 were designed for long range communications from ground vehicles.

They are covered in this section.

In 1986 and 1987 *Old Timers Bulletin*, published by the Antique Wireless Association, carried two articles by H A Robinson, W3LW, who was involved in the original design of the BC-312/342 and BC-224/348. The following information is based on those articles.

Both the BC-312 and BC-224 were the outgrowth of a conference in Washington in 1934 called to prepare a technical specification for a high frequency, general coverage receiver for long range airborne applications. RCA later won out over GE in a competition to produce a prototype meeting the standards adopted by the conference. They were awarded the first production contract and built 650 BC-224A in 1936 and 1937.

The Signal Corps took the specifications from the Washington conference and designed their own ruggedized version of the receiver for ground vehicle use. GE won the bid to produce the first 150 BC-312A receivers to the Signal Corps design. There were production problems with the BC-312A and RCA, using their experience with the BC-224A, redesigned the receiver and received a contract to produce the BC-312B.

Once the designs were stabilized, qualified manufacturers were asked to bid on production contracts. Each contract was given a different suffix letter. Some of the companies who manufactured these receivers were:

| | |
|---|---|
| Belmont | BC-224, BC-348 |
| Crosley | BC-312 |
| Farnsworth | BC-342N, BC-312 |
| GE | BC-312A |
| RCA | BC-224A, BC-312B |
| Stromberg-Carlson | BC-224, BC-348 |
| Wells-Gardner | BC-224, BC-348J,N,Q |

Another group of receivers used by many amateurs during the 1940's and 1950's were from the SCR-274-N (Air Force) and AN/ARC-5 (Navy) command sets used in combat air craft. The command sets consisted of racks into which miniature, modularized receivers and transmitters could be plugged. There were a series of seven receivers and transmitters covering the frequencies from 190 kHz to 27 mHz.

The command sets derived from the type K set designed by the little Aircraft Radio Co, Boonton, NJ, in 1934 and 1935 to replace the old SCR-183 and GR/RU, both of which used TRF receivers. The Navy adopted the design in 1939 and the Air Force in 1940. Almost 1,500,000 receivers and transmitters were built during WW II by Aircraft Radio, Colonial Radio, Lewyt Corp, Stromberg-Carlson and Western Electric.

Priced at under $10.00 on the surplus market, the little receivers were found in many ham shacks after the war. The most popular models were the BC-454 (3-6 mHz) and the BC-455 (6-9 mHz). Also, the BC-453 (190-550 kHz), with an IF of 85 kHz, became popular as the "Lazy Man's Q5-er" to improve the selectivity of the main receiver.

**MODEL:** ARR-11 **REMARKS:** BC-348

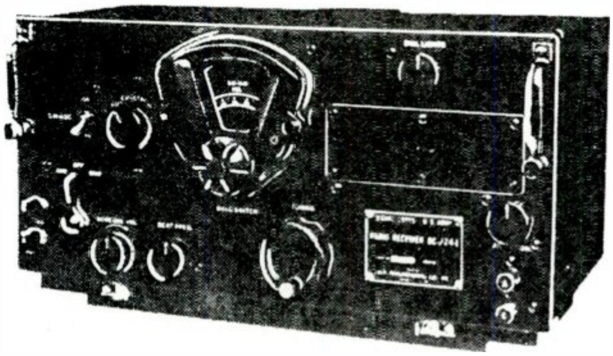
**MODEL:** ARR-41 **REMARKS:** R-648

**MODEL:** BC-224A **YRS:** 1936-37 **BANDS:** 6, 1.5-18 mHz **IF:** 915 kHz **FILTER:** Crystal **TUBES:** 9, 2 6D6 rf, 6A7 mix, 6C6 hfo, 6D6 if1, others not known **REMARKS:** 12/14 VDC dynamotor power supply. RCA built 650 on first production run.

**MODEL:** BC-224B **YRS:** 1938-39 **BANDS:** 6, 1.5-18 mHz **IF:** 915 kHz **FILTER:** Crystal **TUBES:** 9, 2 6K7 rf, 6J7 mix, 6C5 hfo, 6K7 if1, 6F7 if2/bfo, 6B8 if3/det/avc, 41 (or 6K6) af out, 991 vr **REMARKS:** Improved ruggedness and accessability for servicing. This model also built by RCA.

**MODEL:** BC-224C/D **BANDS:** 6, 0.2-0.5, 1.5-18 mHz **REMARKS:** Follow-on production runs of BC-224B with added LF range, built by various manufacturers.

## MILITARY

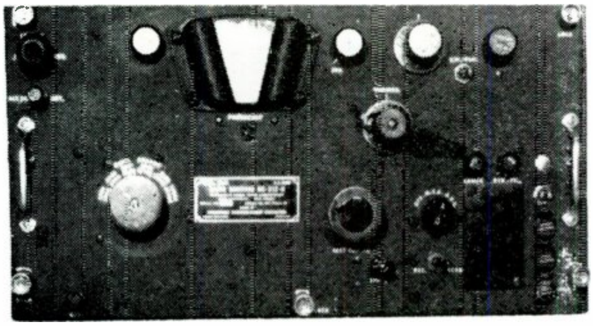


**MODEL**: BC-224E **BANDS**: 6. 0.2-0.5, 1.5-18 mHz **IF**: 915 kHz **FILTER**: Crystal **TUBES**: 8, 2 6SK7 rf, 6SA7 conv, 2 6SK7 if1/2, 6SJ7 if3, 6SR7 det/avc/bfo, 6K6 af out **REMARKS**: Single-ended tubes.

**MODEL**: BC-224F/G/H **REMARKS**: Details not known.

**MODEL**: BC-312A/B/C **YRS**: 1938-39 **BANDS**: 6, 1.5-18 mHz **IF**: 470 kHz **FILTER**: Crystal **TUBES**: 9 **REMARKS**: Included temperature stabilizing heaters for HFO and antenna noise balancing circuit. First production run of 150 sets (A) by GE, second run (B) by RCA. Ruggedized version of BC-224/348 for ground vehicle use. 12/14 VDC dynamotor power supply.

**MODEL**: BC-312D/E/F/G **YRS**: 1940-45 **BANDS**: 6, 1.5-18 mHz **IF**: 470 kHz **FILTER**: Crystal **TUBES**: 9, 2 6K7 rf, 6L7 mix, 6C5 hfo, 2 6K7 if, 6R7 det/avc/af1, 6C5 bfo, 6F6 af out **ANT IN**: 2 screw term, unbal **AF OUT**: 4000/250 Ω **REMARKS**: 12/14 VDC dynamotor power supply. Eliminates HFO temperature stabilizing heaters and antenna noise balancing circuit. Produced by several different manufacturers.

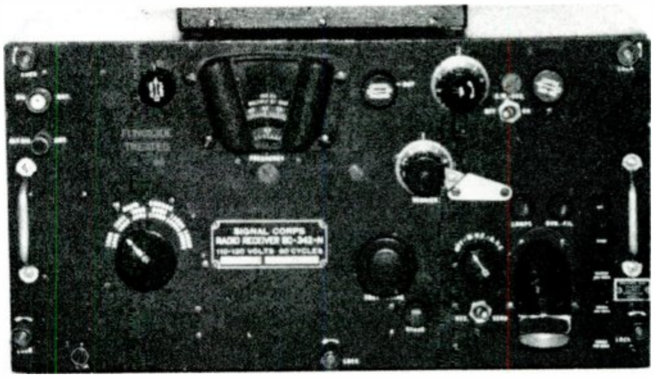


## MILITARY

**MODEL**: BC-312H-N **REMARKS**: Follow-on production by several manufacturers. Details not known.

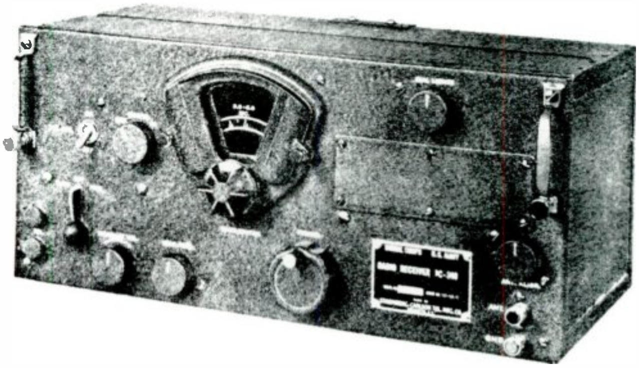
**MODEL**: BC-312-HX **REMARKS**: "X" denotes 24/28 VDC power supply. 12A6 AF out tube.

**MODEL**: BC-312H-NX **REMARKS**: "X" denotes 24/28 VDC power supply. 12A6 AF out tube.



Courtesy Dennis DuVall and *Electric Radio*

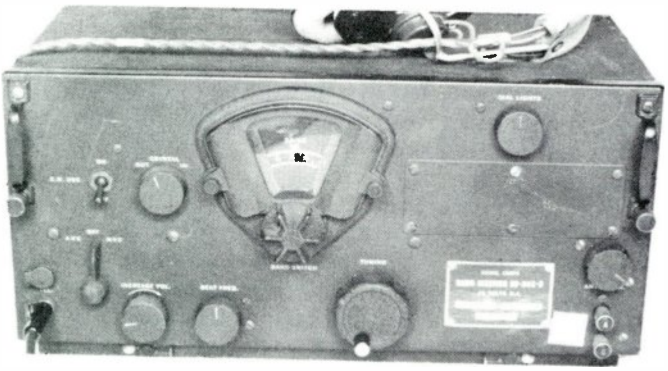
**MODEL**: BC-342A-R **YRS**: 1940-45 **BANDS**: 6, 1.5-18 mHz **IF**: 470 kHz **FILTER**: Crystal **TUBES**: 10, Same as BC-312 plus rect **REMARKS**: RA-20 power supply replaces dynamotor.



Courtesy *Old Timers Bulletin* and AWA

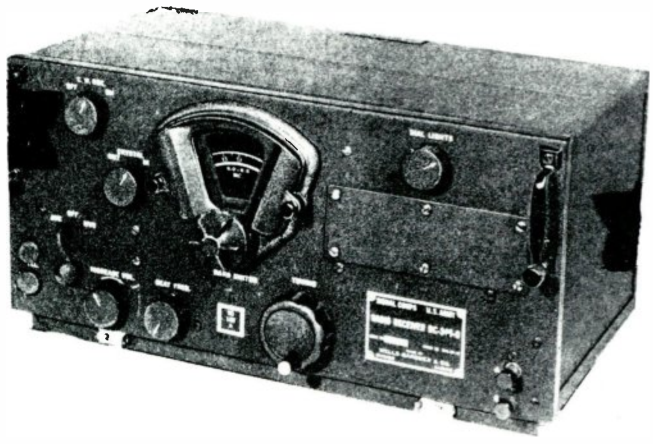
**MODEL**: BC-348B **YRS**: 1938-39 **BANDS**: 6, 1.5-18 mHz **REMARKS**: 24/28 VDC version of BC-224B. Produced by RCA.

## MILITARY



Courtesy Walt Hutchens and *Electric Radio*

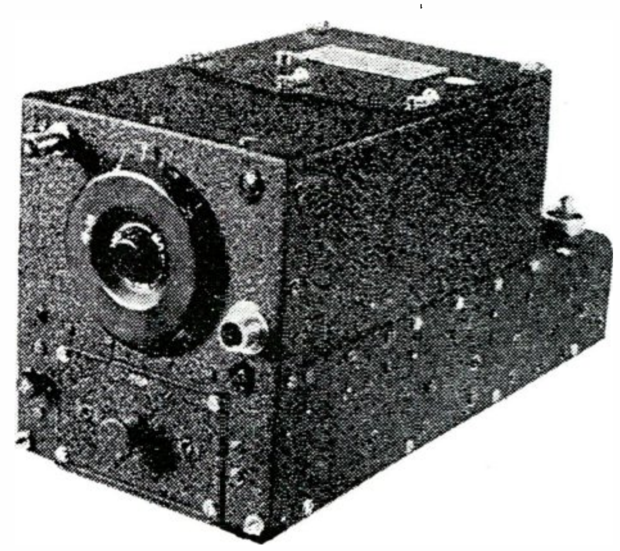
**MODEL:** BC-348C/E/H/K/L/M/O/P/R/S **YRS:** 1940-46 **BANDS:** 6, 0.2-0.5, 1.5-18 mHz **IF:** 915 kHz **FILTER:** Crystal **TUBES:** 9, 2 6K7 rf, 6J7 mix, 6C5 hfo, 6K7 if1, 6F7 if2/bfo, 6B8 if3/det/avc, 41(or 6K6) af out, 991 vr **ANT IN:** 2 term, A, G **AF OUT:** 4000/300 Ω **REMARKS:** 24/28 VDC power supply.



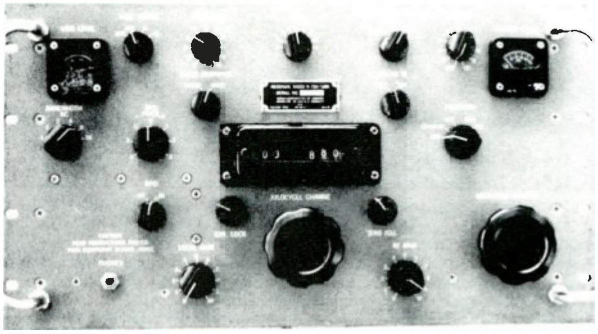
**MODEL:** BC-348J/N/Q **YRS:** 1943-46 **BANDS:** 6, 0.2-0.5, 1.5-18 mHz **IF:** 915 kHz **FILTER:** Crystal **TUBES:** 8, 2 6SK7 rf, 6SA7 conv, 2 6SK7 if, 6SJ7 if3, 6SR7 det/avc/bfo, 6K6 af out **ANT IN:** 2 term, A, G **AF OUT:** 4000/300 Ω **REMARKS:** Later single-ended tube design built by Wells-Gardner.

**MODEL:** BC-454-A **YRS:** 1939-1945 **BANDS:** 1, 3-6 mHz **IF:** 1415 kHz **FILTER:** None **TUBES:** 6, 12SK7 rf, 12K8 conv, 2 12SK7 if, 12SR7 det/bfo, 12A6 af out **AF OUT:** 8000 Ω **REMARKS:** 24/28 VDC dynamotor power supply.

## MILITARY



**MODEL:** BC-455-A **YRS:** 1939-45 **BANDS:** 1, 6-9.1 mHz **IF:** 2830 kHz **FILTER:** None **TUBES:** 6, 12SK7 rf, 12K8 conv, 2 12SK7 if, 12SR7 det/bfo, 12A6 af out, **AF OUT:** 8000 Ω **REMARKS:** 24/28 VDC dynamotor power supply.



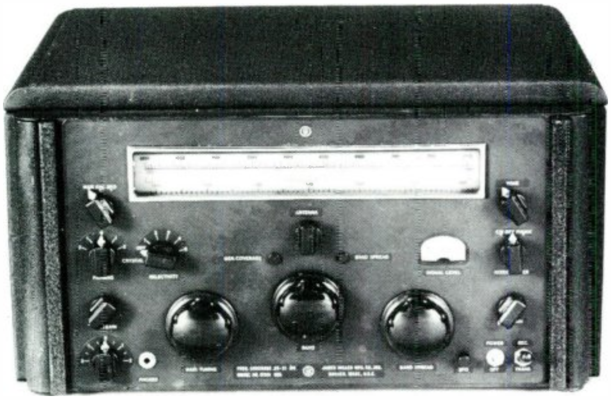
Courtesy Thomas Marcotte and *Electric Radio*

**MODEL:** R-725 **YRS:** 1965-73 **FILTER:** 455 kHz L/C **REMARKS:** R-390A modified to use R-390 IF deck eliminating mechanical filters. Built for NSA and used in an array of 4-8 receivers in the Army TRD-15 DF set. Designed by Motorola and built by Servo and Arvin.

## MILLEN

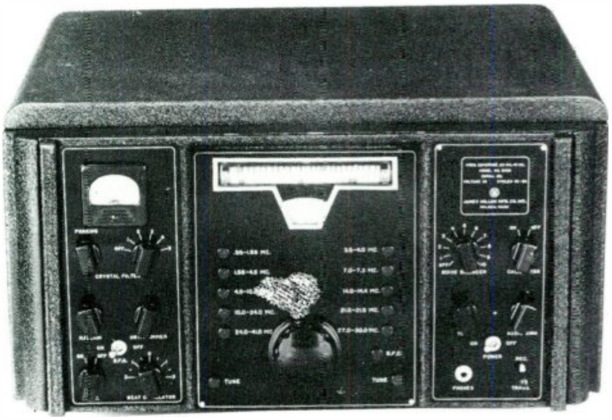
James Millen left National in 1939 to form his own company. The James Millen Manufacturing Co, Malden, MA, produced high quality components and accessories. Millen designed two communications receivers for introduction after World War II. Plans were changed and they never made it to market.

## MILLEN



Courtesy Alan Douglas

**MODEL:** DFP 201 **BANDS:** 5, .55-31.5 mHz **TYPE:** Double conversion, tunable HFO **IF:** First IF ?, 455 kHz **FILTER:** Crystal **TUBES:** 11 + 3 semi diodes, 6AK5 rf, 6BE6 mix, 6BA6 hfo, 6BE6 mix2/xco, 2 6BA6 if, 6AT6 det/avc/af1, 6BA6 bfo. 6V6 af out, 5Y3 rect, VR-105 vr, 3 1N34 noise lim **AF OUT:** 4 W, 8/500 Ω **REMARKS:** Bandswitching via sliding coil catacomb as in NC-100 et al.

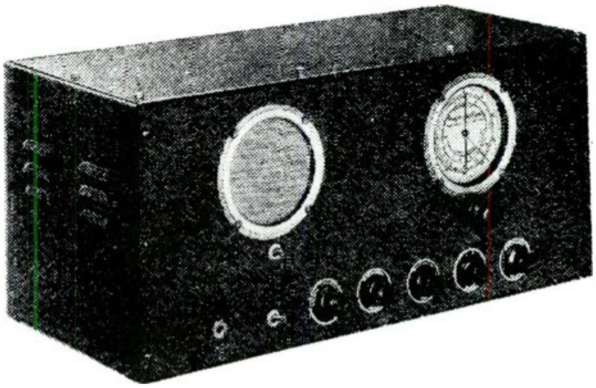


Courtesy Alan Douglas

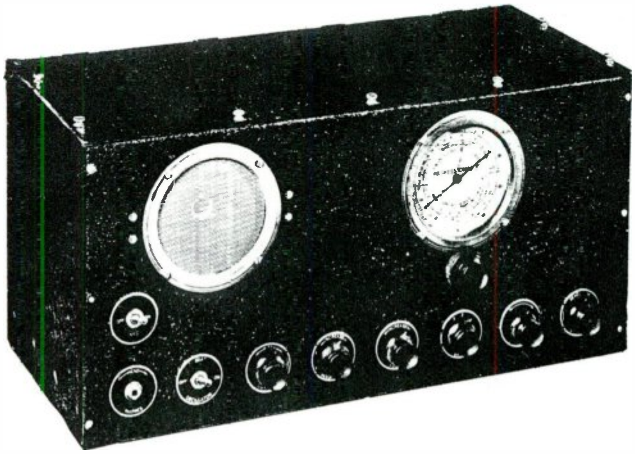
**MODEL:** DFP 501 **BANDS:** 5 GC, .55-41.5 mHz, 5 ham bandspread, 80-10 mtrs **TYPE:** Double conversion, tunable hfo **IF:** First IF ?, 455 kHz **FILTER:** Crystal **TUBES:** 19 + 2 semi diodes, 2 6AK5 rf, 6L7 mix1, 6SJ7 hfo, 6SK7 if1, 6K8 mix2/xco, 6L7 if2, 6SJ7 noise amp, 6SK7 if3, 6SK7 avc amp, 6SK7 bfo, 6H6 det/avc, 6SJ7 af1, 6J5 phase split, 2 6V6 p/p af out, 6K8 xtal calib, 5U4 rect, VR-150 vr, 2 1N34 noise rect **ANT IN:** 3 jack/term **AF OUT:** 8 W, 8/600 Ω **REMARKS:** Push-button operated power bandswitching via movable coil catacombs as in NC-100 et al.

## MONTGOMERY WARD

This large mail-order retailer has sold a number house brand communications receivers over the years.



**MODEL:** Professional Model 37 (early model) **YRS:** 1935 **PRICE:** $52.95 **BANDS:** 3, .54-18 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 7, 78 rf, 6A7 conv, 78 if, 75 det/avc/af1, 78 bfo, 42 af out, 80 rect **ANT IN:** 2 screw term **REMARKS:** Airplane dial, internal speaker. Built by Hallicrafters. This model pictured in a review and in the MW ad in the October, 1935, *Radio News*.

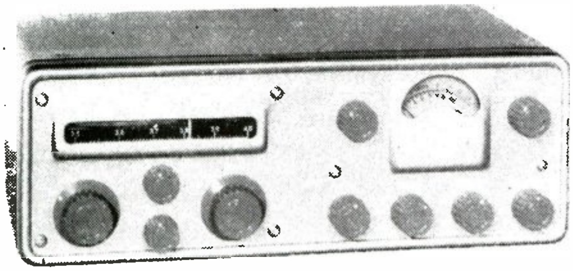


**MODEL:** Professional Model 37 (later model) **YRS:** 1936-37 **REMARKS:** This receiver is identical to Hallicrafters Super 7 and is pictured in the 1936 MW catalog and in a November, 1937, review of the MW OR-5 transmitter in *Radio News.*

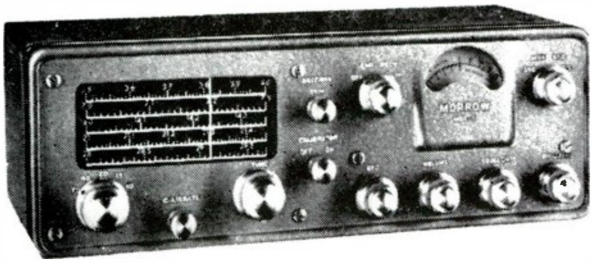
## MORROW

The Morrow Radio Manufacturing Co, 2794 Market St, Salem, Oregon, produced mobile communications equipment during the mid-1950's.

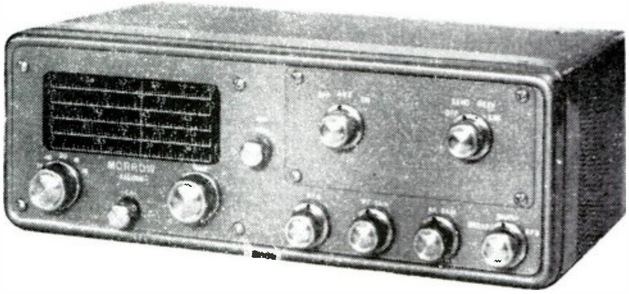
## MORROW



**MODEL:** MB-6 **YRS:** 1957-59 **PRICE:** $239.50 **TYPE:** Double conversion, tunable HFO **BANDS:** 5 ham bands, 10-80 mtrs **TUBES:** 13 **REMARKS:** Mobile type, separate power supply.

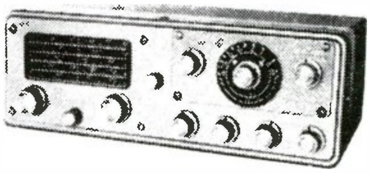


**MODEL:** MBR-5 **YRS:** 1955-57 **PRICE:** $224.50 **BANDS:** 5, 10-80 mtrs **TYPE:** Double conversion, variable hfo **IF:** 1525, 200 kHz **FILTER:** None **TUBES:** 13, 6BZ6 rf, 12AT7 mix1/hfo, 6BJ6 if1, 6BE6 mix2/xco, 6BJ6 if2, 6T8 det/bfo, 6AL5 noise rect, 12AT7 noise amp/meter amp, 6AL5 nl, 12AX7 af1/sq, 6C4 af2, 6AQ5 af out, 6BJ6 calib **REMARKS:** Mobile type, separate power supply.



**MODEL:** Falcon **YRS:** 1957 **PRICE:** $169 **BANDS:** 5, 75-10 mtrs **TYPE:** Dual conversion, tunable hfo **REMARKS:** Mobile type, separate power supply. Available with BC tuner installed as accessory.

## MORROW



**MODEL:** Falcon with BCT **PRICE:** $189 **REMARKS:** Adds BCT broadcast tuner and conelrad monitor to Falcon.

## MOSLEY

Mosley Electronics, 4610 North Lindbergh Blvd, Bridgeton, MO, manufactured antennas. They attempted to enter the amateur equipment market in 1961 with an innovative ham band receiver.

Mosley CM-1
PRESELECTOR
GAIN
PHONES
PITCH

**MODEL:** CM-1 **YRS:** 1961-62 **PRICE:** $169.95 **BANDS:** 7, 650 kHz bands, 80-10 mtrs **TYPE:** Double conversion, fixed hfo **IF:** 3500-4100, 455 kHz **FILTER:** None **TUBES:** 5 + 4 semi diodes, 6AW8A mix1/xco, 6AW8A mix2/vfo, 6AW8A if1/af1, 6AW8A if2/prod det, 6AW8A af out/bfo, 1N34 am det, 2 1N54A nl, 2F4 rect **ANT IN:** 2 screw term, unbal **AF OUT:** 0.5, W, 4 Ω.

## MULTI-ELMAC

The Multi-Products Co, was located at 559 East Ten Mile Road, Hazel Park, Mich, during the early 1950's and at 21470 Coolidge Highway, Oak Park, Mich, after 1955. They produced the Multi-Elmac line of mobile equipment until 1962.

## MULTI-ELMAC

ELMAC
MODEL
PMR6A
1 2 3 4 5 6

**MODEL:** PMR 6-A **YRS:** 1953-55 **PRICE:** $134.50 **BANDS:** 6, BC + 10-80 mtrs **TYPE:** Double conversion, variable hfo **IF:** 1600, 455 kHz **FILTER:** None **TUBES:** 10, 6BJ6 rf, 6BE6 mix, 6C4 hfo, 6BE6 conv, 2 6BJ6 if, 6AL5 det/nl, 12AT7 af1/bfo, OB2 vr, 6BK5 af out **ANT IN:** Motorola conn, 50-72 Ω **AF OUT:** 3.5 W, 3-6 Ω **REMARKS:** Mobile type receiver, separate power supply.

SQ INJ.
BFO
BAND
ANT.
ANL
AF-RF

**MODEL:** PMR-7 **YRS:** 1955-57 **PRICE:** $159 **BANDS:** 7, BC + 160-10 mtrs **TYPE:** Double conversion, variable hfo **IF:** 2238, 262 kHz **FILTER:** 262 kHz L/C **TUBES:** 10, 6BZ6 rf, 6BE6 mix1, 6C4 hfo, 6BJ6 if, 6X8 mix2/xco, 6BA6 if, 6BJ7 det/anl/avc, 6AN8 af1/sq, 12AU7 bfo/amp, 6AQ5 af out **REMARKS:** Mobile type receiver, external power supply.

**MODEL:** PMR-7A **YRS:** 1958 **PRICE:** $159.50 **REMARKS:** Mobile type receiver, separate power supply.

## MULTI-ELMAC

MODEL
BFO
PMR-8
TUNING
R.F. GAIN
SSB
CW
AM
BAND
ANT.
ANL
OFF
A.F. GAIN

**MODEL:** PMR-8 **YRS:** 1960-62 **PRICE:** $189.50 **BANDS:** 7, BC + 80-6 mtrs **TYPE:** Double conversion, variable hfo **IF:** 2238, 262 kHz **FILTER:** 262 kHz L/C **TUBES:** 8 **REMARKS:** Mobile type receiver, separate power supply.

**MODEL:** PMR-12-A **YRS:** 1955 **PRICE:** $134.50 **REMARKS:** 12 volt version of the PMR 6-A.

## NATIONAL

The National Company was established in 1914 in Cambridge, MA. They manufactured mechanical parts, including toys, until 1924 when they began producing the famous Browning-Drake broadcast receiver kit. In the same year they used their mechanical expertise to begin manufacturing radio components including variable capacitors and the classic "velvet vernier" dials.

James Millen joined National in 1928 as Chief Engineer and General Manager and guided the company to the forefront of the short wave receiver business where they stayed until he left the company ten years later. Millen was a mechanical engineer and the receivers designed during his tenure reflected that background. He was a ham and held the calls W2BYP, W1AXL and W1HRX. Millen was also a prolific writer whose articles on the latest developments at National appeared almost monthly in the popular radio magazines of the '20's and '30's.

**NATIONAL**

Jim Millen's first receivers at National were the "Thrill Box" series of regenerative sets produced during the late 1920's and early 1930's. These included the famous SW-5 and SW-3.

Then, in July, 1932, National introduced the most advanced communications receiver of the time, the AGS. This receiver was developed for Aircraft Ground Station use in conjunction with the Airways Division of the U. S. Dept of Commerce. It was a nine tube receiver with a tuned RF stage and AVC. The set was advertised in *QST* for affluent amateurs who could afford the very best, but very few of them turned up in ham shacks. There were not many affluent amateurs in 1932 and 1933.

Next came the FB-7, a stripped down version of the AGS for ham station use, in February, 1933. Selling for $26.46 the little FB-7 came with one set of plug-in coils but without a power supply. An optional crystal filter was later offered in a version designated the FBX.

Late in 1933 work began on a communications receiver which was destined to become the most famous in history, a receiver which remained in production in recognizable form for 30 years. The receiver was the HRO and was first mentioned in print in Jim Millen's column in *QST* in August, 1934. He said the set was designed for the ham bands and fell between the FB-7 and AGS in price and performance. The first advertisement which appeared in the October, 1934, *QST* had a photo of a prototype which was quite different from the final version which started delivery in March, 1935.

Changes were apparently made late in the design of the HRO and it came on the market as a general coverage receiver and surpassed the AGS both in performance and price. The PW dial and gear drive, the ganged capacitors and the ganged coils and coil compartments were classics of mechanical design.

**NATIONAL**

Millen's mechanical engineering background was apparent again in the next receivers introduced by National in 1936, the general coverage NC-100 and the amateur band NC-101. These sets replaced the plug-in coils with a gear driven coil catacomb. The coils were contained in a die cast catacomb which was moved along a rail to bring the desired coil set into position. This scheme continued in use on the NC-200 and NC-240 series until 1949. Millen clung to his dislike for conventional bandswitching to the end. The DFP 201 and DFP 501 receivers which he designed for his own company after WW II used the movable coil catacomb.

It is interesting that National did not employ the conventional coil switching method of band changing in any but their cheaper receivers until 1947. The HRO used the ganged plug-in coils to the end in the early 1960's. Other receivers used the gear driven coil catacomb.

National's approach during the Millen years was to design and manufacture all the key components for their receivers including the tuning capacitors, IF transformers, coils and tuning mechanisms. The quality, electrically and mechanically, was superior and it is informative of National's philosoply that in 1937 when they introduced the medium priced NC-80 series they were apologetic in their advertising, saying, "Most amateurs do not need to be told that when a communications receiver is to be sold for as low a price as the NC-80, it is necessary to make compromises."

In 1939 National went public in spite of internal disagreement over the action. As a result, the following announcement appeared in June *QST*. "James Millen announces that on May first, 1939, he completely withdrew from the National Company, Inc, in order to establish a new company...known as the James Millen Manufacturing Company, Inc." Thus began the decline of National. The company was never again a leading innovator in the commercial communications receiver business except for a brief time early in the solid state era.

During World War II National produced quantities of equipment for the armed services, particularly the Navy. Prominent were many variations of the NC-100A and HRO receivers.

After the war National continued their prewar line of receivers essentially unchanged except for some cosmetic face lifts. In 1947 they introduced the NC-183, their first really new receiver since 1936. New for National, that is. The NC-183 was a rather conventional bandswitching receiver by the standards of other companies.

Like Hallicrafters, National tried to capitalize on their reputation in the short wave field by testing the consumer market with television receivers and high fidelity equipment. It turned out to be a competitive, money losing business and was soon abandoned.

During the 1950's and 1960's National was busy in military/defense electronics. Some of the prominent equipment during these decades were the WRR-2 super stable SSB receiver, standard receiver for Navy shipboard use, and the R-1490/GRR-17 high performance, solid-state communications receiver. Also noteworthy was the NC-2001 Atomichron, the first commercially available atomic primary time and frequency standard.

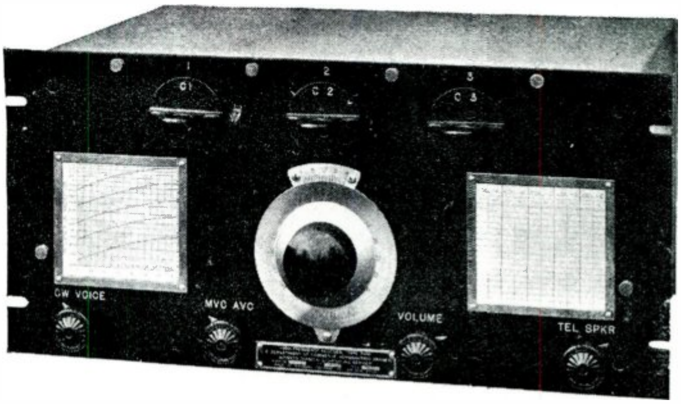
In 1955 National made a last attempt to regain its past glories in the amateur receiver field. They ran advertisements for several months hailing a new "dream receiver" which showed a cloth-draped receiver with all its details hidden, like a statue prior to its unveiling. This turned out to be the NC-300 amateur band receiver. It was followed in 1958 by the improved NC-303. Unfortunately, like Hallicrafters, they misread the public's changing tastes. The advertisements boasted that the receiver was "massive in the modern manner." The modern manner turned out to be lighter, smaller high performance receivers which Collins (75S-1) and Drake (1-A) were about to introduce. The days of the heavy, massive receiver were dead.

National was a pioneer in the development of the solid-state receiver. The HRO-500 introduced in 1964, was the first completely solid-state receiver and was the first communications receiver to use a frequency synthesizer. Perhaps it was a little ahead of its time. The HRO-500 was popular and widely admired but it didn't save the company.

National Radio Company existed under Chapter 11 for a decade or more, but gave up the struggle in 1992 when the IRS forced them to liquidate and auction off their assets.

Thanks to Wayne Childress for his permission to use the extensive addenda to the National section which were published in *Old Timers Bulletin*, August 1996. Thanks also to the Antique Wireless Association.

**MODEL:** AGL **YRS:** 1933-34 **REMARKS:** Long wave version of AGS with a Frequency Selector Switch substituted for the plug-in coils and Type "B" dial.



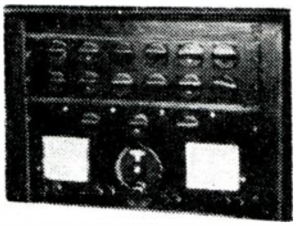
**MODEL:** AGS **YRS:** 1932 **BANDS:** 2.4-20 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 9, 4 236, 4 237, 238 **ANT IN:** bal/unbal **REMARKS:** Plug-in coils, separate power supply, round Type "N" dial. Developed for Aircraft Ground Stations in conjunction with Airways Division of the U. S. Dept of Commerce.

**MODEL:** AGS (Variation 1) **YRS:** 1933 **PRICE:** $161.70 **BANDS:** 5, 1.5-20 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 9, 236 rf, 236 mix, 236 hfo, 2 236 if, 237 det, 236 avc, 237 bfo, 238 af out **REMARKS:** Plug-in coils, separate power supply. Bandspread coils available.

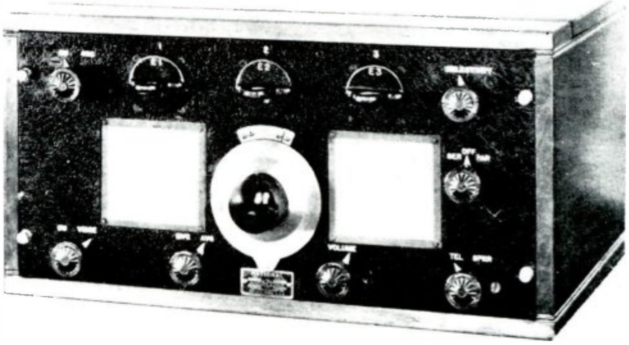
**MODEL:** AGS (Variation 2) **YRS:** 1933 **BANDS:** 5, 1.5-20 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 9, 236 rf, 236 mix, 236 hfo, 2 236 if, 237 det, 236 avc, 237 bfo, 89 af out **REMARKS:** Plug-in coils, separate power supply. Change from Variation 1: audio output tube changed to 89.

**MODEL:** AGS (Variation 3) **YRS:** 1933-34 **BANDS:** 5, 1.5-20 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 9, 236 rf, 236 mix, 236 hfo, 2 236 if, 237 det, 236 bfo, 236 avc, 89 af out **REMARKS:** Plug-in coils, separate power supply. Changes from Variation 2: BFO tube changed to 236.

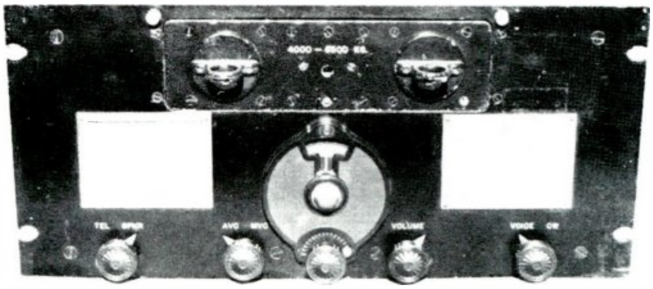
**MODEL:** AGS (Variation 4) **YRS:** 1934 **PRICE:** $265 (list) **BANDS:** 5, 1.5-20 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 9, 78 rf, 77 mix, 36 hfo, 2 78 if, 37 det. 36 bfo, 36 avc, 89 af out **REMARKS:** Plug-in coils, separate power supply. Changes from variation 3: added a 77 and 3 78's, replacing 4 36's.



**MODEL:** AGS (Variation 5) **YRS:** 1933 **REMARKS:** The standard round dial replaced with a velvet vernier Type "B" (SW-3).

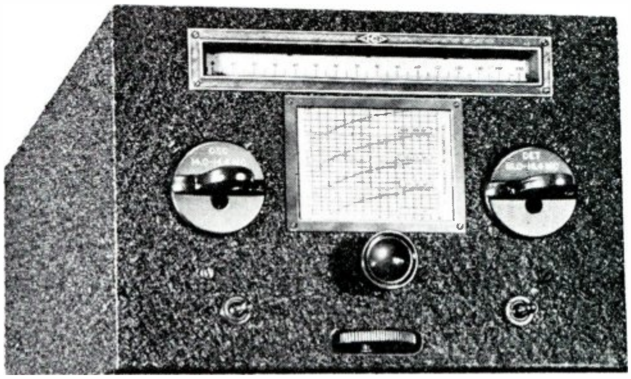


**MODEL:** AGS-X **YRS:** 1933-34 **PRICE:** $295 (list) **FILTER:** Crystal **REMARKS:** AGS with crystal filter. Adds CW OSC tuning control in upper left and crystal selectivity and ser/par controls in upper right.



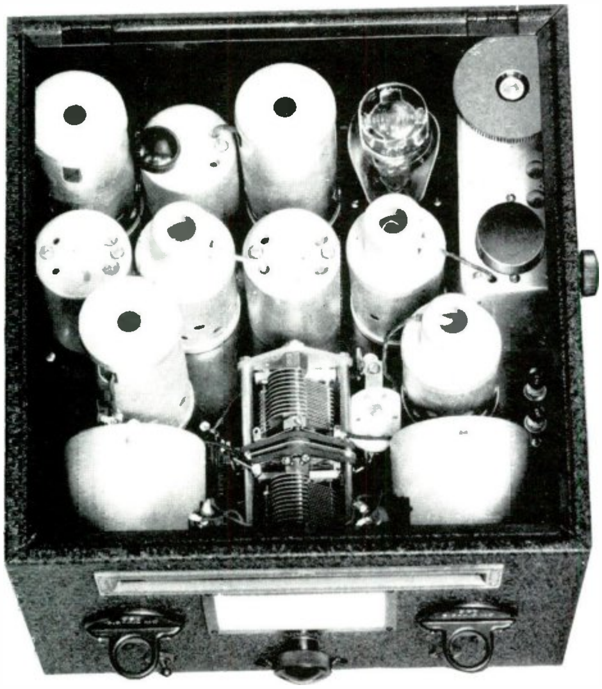
Courtesy Henry Rogers and *Electric Radio*

**MODEL:** AGU **YRS:** 1933 **REMARKS:** AGS with ganged plug-in coils and Type "B" dial.



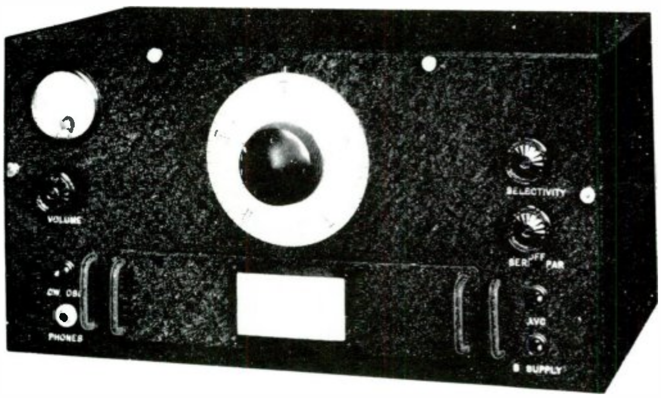
**MODEL:** FB-7 **YRS:** 1933-34 **PRICE:** $26.46 **BANDS:** 6, 1.5-33 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 7, (2.5 V. version) 57 mix, 24 hfo, 2 58 if, 56 det, 59 af out, 24 bfo (6.3 V. version) 77 mix, 36 hfo, 2 78 if, 37 det, 89 af out, 36 bfo **ANT IN:** 2 binding posts, unbal **REMARKS:** External power supply, plug-in coils. Originally offered only to 20 mHz with five sets of coils.

**MODEL:** FB7-A **YRS:** 1933-34 **PRICE:** $31.16 **REMARKS:** FB-7 with air tuned (vs compression mica) IF transformers.

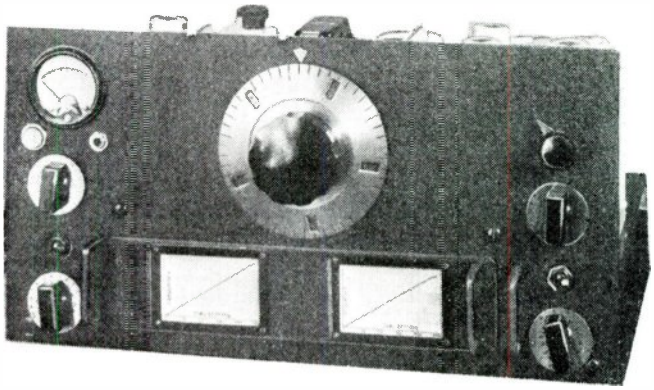


**MODEL:** FBX **YRS:** 1933-34 **PRICE:** $38.22 **FILTER:** Crystal **REMARKS:** FB-7 with crystal filter.

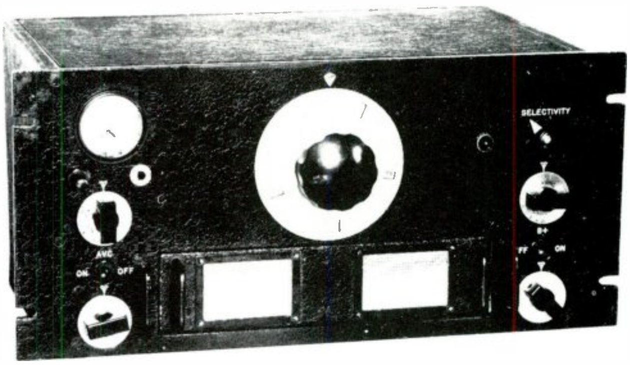
**MODEL:** FBX-A **YRS:** 1933-34 **PRICE:** $42.93 **FILTER:** Crystal **REMARKS:** FBX with air tuned (vs mica compression) IF transformers.



**MODEL:** HRO (Prototype) **YRS:** 1934 **PRICE:** $167.70 **BANDS:** 6, 0.5-30 mHz **IF:** 456 kHz **FILTER:** Plug-in xtal **TUBES:** 9, (2.5 V. model) 2 58 rf, 57 mix, 57 hfo, 2 58 if, 2B7 det/avc/af1, 2A5 af out, 57 bfo, (6.3 V. model) 2 6D6 rf, 6C6 mix, 6C6 hfo, 2 6D6 if, 6B7 det/avc/af1, 42 af out, 6C6 bfo **ANT IN:** 2 binding posts, bal/unbal, 500 Ω **AF OUT:** 7000 Ω **REMARKS:** Plug-in coils, separate power supply. This model shown in advertisements from Oct., 1934, thru Jan., 1935, had no RF Gain, BFO Pitch controls or "S" meter switch. Round, unskirted knobs. Probably never shipped this model.

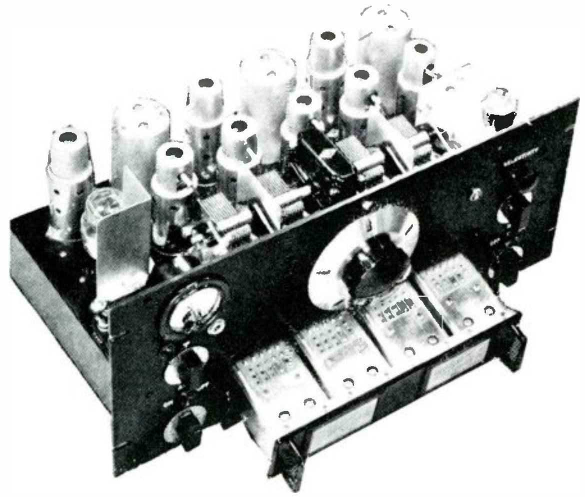


**MODEL:** HRO (Variation 1) **YRS:** 1934-35 **REMARKS:** Details same as HRO (Prototype) except added RF Gain, BFO Pitch and "S" meter switch, replaced round knobs with bar knobs with round skirts, no markings on B+ and AVC switches and selectivity control (except for rack mount version which has engraved markings). White push type "S" meter switch.

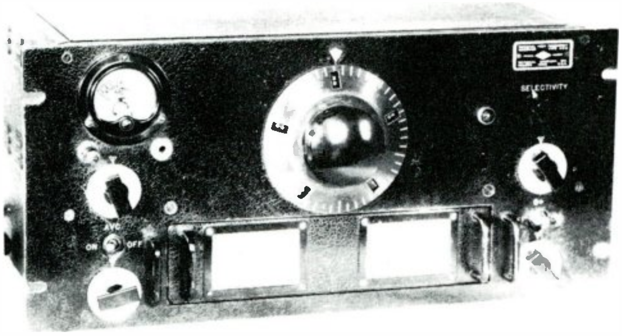


Courtesy AWA and *AWA Review*

**MODEL:** HRO (Variation 2) **YRS:** 1935-36 **REMARKS:** Added panel light to left of selectivity switch, calibration charts changed to white on black, "S" meter switch changed to push/pull type.

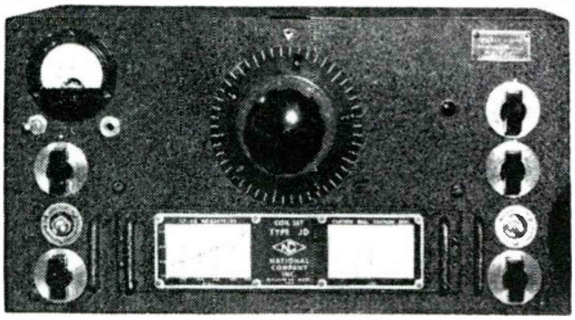


**MODEL:** HRO (Variation 3) **YRS:** 1936-38 **REMARKS:** Added engraved panel markings for B+, AVC and selectivity. Photos still show round IF transformers and black chassis.

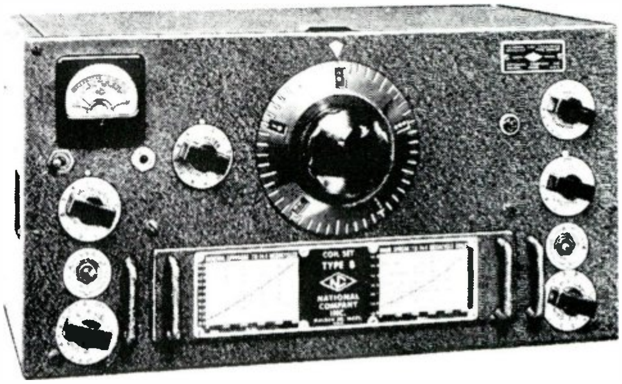


Courtesy AWA and *AWA Review*

**MODEL:** HRO (Variation 4) **YRS:** 1938-1943 **REMARKS:** Black bakelite dial, rectangular IF cans, otherwise same.



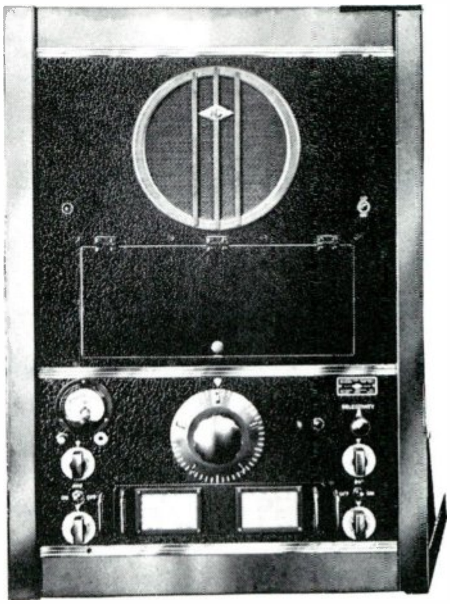
**MODEL:** HRO (Variation 5) **YRS:** 1943-45 **REMARKS:** This variation used for HRO-5, -M, -W, et al. AVC and B+ switches have circumferential metal labels, selectivity contol changed to bar knob with circular skirt, "S" meter switch changed to toggle, crystal mounted inside filter case, printed metal calibration charts.



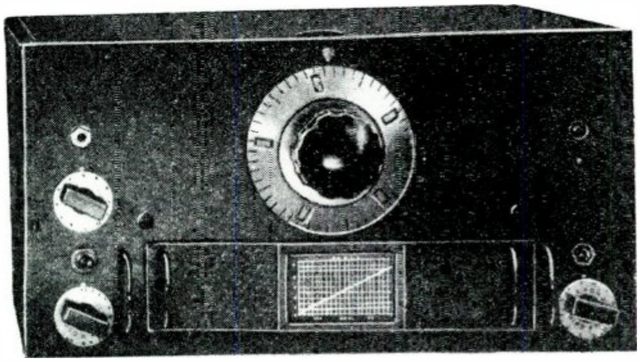
**MODEL:** HRO (Variation 6) **YRS:** 1946-47 **REMARKS:** Rectangular bakelite "S" meter, noise limiter control added between PW dial and phone jack, printed metal charts on coil gangs. Used for HRO-5A1, last receiver using the original HRO basic look.

**MODEL:** HRO-B **TUBES:** 9, 2 6D6 rf, 6C6 mix, 6C6 hfo, 2 6D6 if, 6B7 det/avc/af1, 42 af out, 6C6 bfo **AF OUT:** 1.5 W. **REMARKS:** Variation 4, battery model optimized to operate with 180 V. B+ at 55 mA (vs 230 V./75 mA).

**MODEL:** HRO-B-JR **REMARKS:** Ref. HRO-B and HRO-JR.



**MODEL:** HRO-C **PRICE:** $259.50 **REMARKS:** HRO in table rack with SPC coil storage unit, power supply and speaker.



**MODEL:** HRO-JR **YRS:** 1936-43 **PRICE:** $99.00 **REMARKS:** HRO less crystal filter, "S" meter and bandspread.

**MODEL:** HRO-M **YRS:** 1944-45 **BANDS:** 9, .05-30 mHz **IF:** 456 kHz **FILTER:** Plug-in xtal **TUBES:** 9, 2 6D6 rf, 6C6 mix, 6C6 hfo, 2 6D6 if, 6B7 det/avc/af1, 42 af out, 6C6 bfo **AF OUT:** 1.5 W. **REMARKS:** Variation 5, no bandspread.

**MODEL:** HRO-M-RR **REMARKS:** Relay rack version of HRO-M.

**MODEL:** HRO-M-TM **REMARKS:** Table model version of HRO-M.

**MODEL:** HRO-MX **REMARKS:** HRO-M with built in xtal.

**MODEL:** HRO-S **YRS:** 1934 **TUBES:** 10, same as HRO (Prototype), 2.5 V. series, with addition of 80 rect **REMARKS:** Built-in power supply. Doubt if any of these were ever sold.

**MODEL:** HRO-SPC **REMARKS:** HRO in 24½" table rack including HRO, power supply, speaker and 5 compartment coil storage rack. See HRO-C.

**MODEL:** HRO-SR **REMARKS:** HRO-SR (senior) designation sometimes used for standard HRO after introduction of the HRO-JR.

**MODEL:** HRO-W **YRS:** 1944-45 **BANDS:** 9, .05-30 mHz **IF:** 456 kHz **FILTER:** Built-in xtal **TUBES:** 9, 2 6K7 rf, 6J7 mix, 6J7 hfo, 2 6K7 if, 6SQ7 det/avc/af1, 6V6 af out, 6J7 bfo **AF OUT:** 1.5 W. **REMARKS:** Variation 5, similar to HRO-5. No bandspread, tropicalized, built for Signal Corps.

**MODEL:** HRO-5 **YRS:** 1944-45 **BANDS:** 9, .05-30 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 9, same as HRO-W **REMARKS:** Separate P/S, plug-in coils, no bandspread, built to JAN specs.

**MODEL:** HRO-5R **REMARKS:** Rack mounted.

**MODEL:** HRO-5T **REMARKS:** Table model.

**MODEL:** HRO-5A **YRS:** 1945-46 **REMARKS:** Same as HRO-5 except civilian construction, has bandspread.

**MODEL:** HRO-5RA **REMARKS:** HRO-5A rack model.

**MODEL:** HRO-5TA **REMARKS:** HRO-5A table model.

**MODEL:** HRO-5TAL **REMARKS:** No information.

**MODEL:** HRO-5C **REMARKS:** Deluxe installation containing an HRO-5A1 and an SPC unit (Power supply, coil container and speaker.)

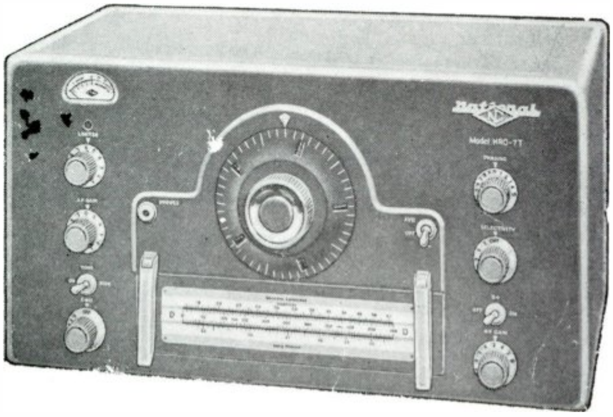
**MODEL:** HRO-5A1 **YRS:** 1946-47 **PRICE:** $274.35 **BANDS:** 9, .05-30 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 11, 2 6K7 rf, 6J7 mix, 6J7 hfo, 2 6K7 if, 6SQ7 det/avc/af1, 6V6 af out, 6J7 bfo, 6J5 nl amp, 6H6 nl rect **ANT IN:** 2 binding posts, 500 Ω, bal/unbal **AF OUT:** 1.5 W, 7000 Ω **REMARKS:** Plug-in coils, separate power supply. Adds noise limiter control to front panel. See Variation 6.

**MODEL:** HRO-5TA-1 **REMARKS:** HRO-5A1 in cabinet for table use.

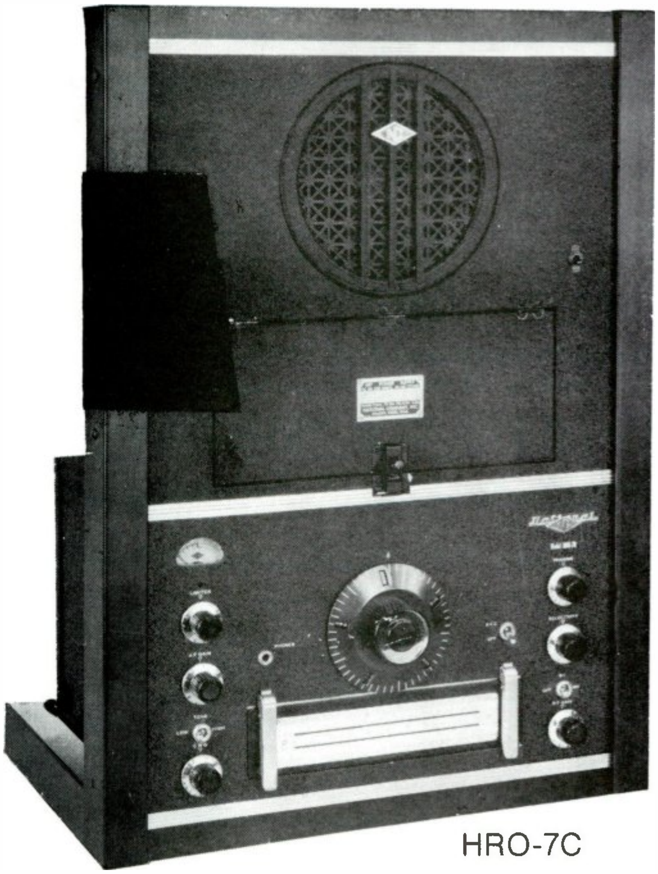
**MODEL:** HRO-5RA-1 **REMARKS:** HRO-5A1 in rack mounting.

## NATIONAL

**MODEL:** HRO-6 **BANDS:** 9, .05-43, .48-30 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 11, 2 6K7 rf, 6J7 mix, 6J7 hfo, 2 6K7 if, 6SQ7 det/avc/af1, 6V6 af out, 6J7 bfo, 6J5 nl amp, 6H6 nl rect **REMARKS:** From the schematic, this appears to be a HRO-5A-1 with a different (improved?) noise limiter. Variation 6.



HRO-7



HRO-7C

## NATIONAL

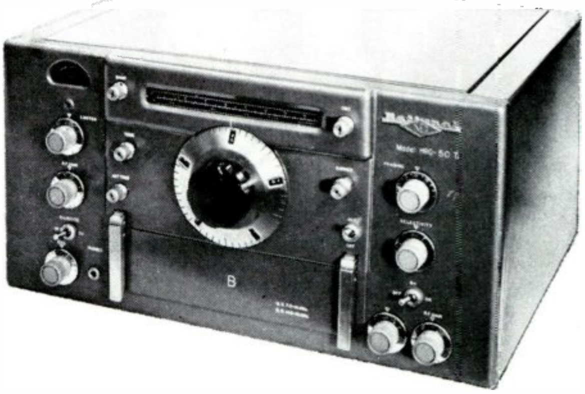
**MODEL:** HRO-7 **YRS:** 1947-49 **PRICE:** $311.36 **BANDS:** 9, .05-33 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 12, 2 6K7 rf, 6J7 mix, 6C4 hfo, 6J7/6K7 if1, 6K7 if2, 6H6 det/avc, 6J7 bfo, 6H6 nl, 6SJ7 af1, 6V6 af out, OA2 vr **ANT IN:** 3 screw term, 300-600 Ω **AF OUT:** 2900 Ω ext out xfmr, 1.5 W. **REMARKS:** Plug-in coils, separate power supply. New, streamlined cabinet.

**MODEL:** HRO-7C **YRS:** 1948-49 **PRICE:** $358 **REMARKS:** HRO-7 in 29" cabinet rack with coil storage compartments, speaker and power supply.

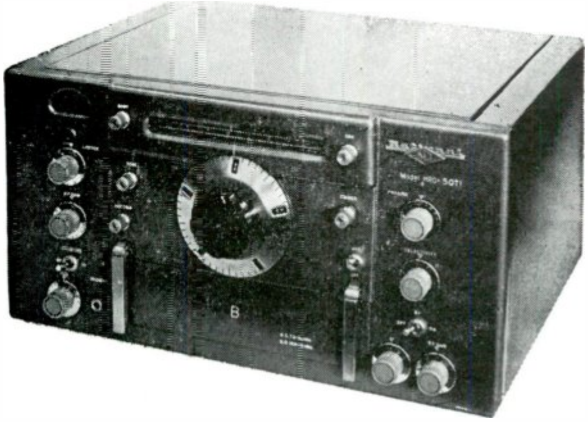
**MODEL:** HRO-7R **REMARKS:** Rack mount version.

**MODEL:** HRO-7T **REMARKS:** Table model.

**MODEL:** HRO-12S **REMARKS:** This receiver is the same as the HRO-M, but without crystal feature and with shock mounts for mobile use. The receiver is supplied with A, B, C, D, E, and G coils. Although unconfirmed, this receiver may have been produced for the Canadian government.



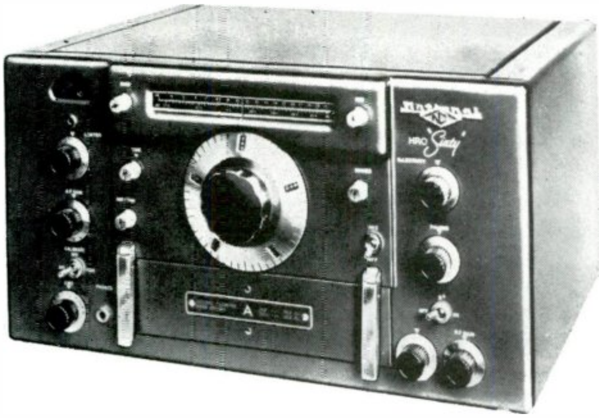
**MODEL:** HRO-50 **YRS:** 1950 **PRICE:** $349 **BANDS:** 9, .05-30 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 15, 2 6BA6 rf, 6BE6 mix, 6C4 hfo, 2 6K7 if, 6H6 det/avc, 6H6 anl, 6SJ7 af1, 6SN7 phase split/mtr amp, 6J7 bfo, 2 6V6 p/p af out, 5V4 rect, OB2 vr **ANT IN:** 3 screw term, A, A, G, 300-600 Ω, 500 Ω nom, varies 110-1250 Ω **AF OUT:** 8 W, 8/500 Ω **REMARKS:** Plug-in coils. PW and direct reading, slide rule dial.



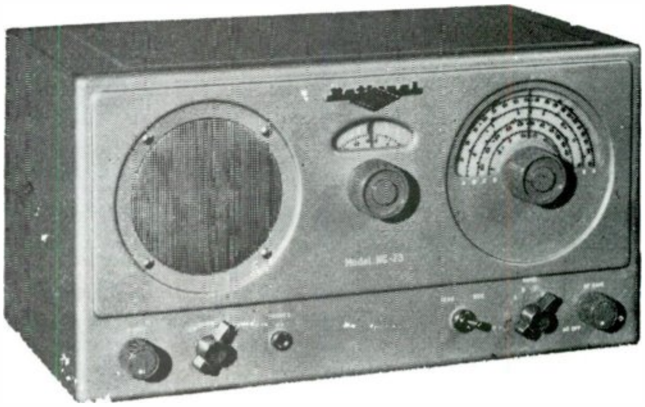
**MODEL:** HRO-50-1 **YRS:** 1951-52 **PRICE:** $383.50 **BANDS:** 9, .05-30 mHz **IF:** 455 kHz **FILTER:** Crystal plus 12 455 kHz L/C circuits **TUBES:** 16, 2 6BA6 rf, 6BE6 mix, 6C4 hfo, 6K7 if1, 2 6SG7 if2/3, 6H6 det/avc, 6H6 nl, 6SN7 phase inv/mtr amp, 6SJ7 af1, 2 6V6 p/p af out, 6J7 bfo, OB2 vr, 5V4 rect **ANT IN:** 3 screw term, A, A, G, 300-600 Ω, 500 Ω nom, varies 110-1250 Ω **AF OUT:** 8 W, 8/500 Ω **REMARKS:** Plug-in coils. HRO-50 with added IF stage and cascaded IF transformers.

**MODEL:** HRO-50R1 **REMARKS:** Rack mount.

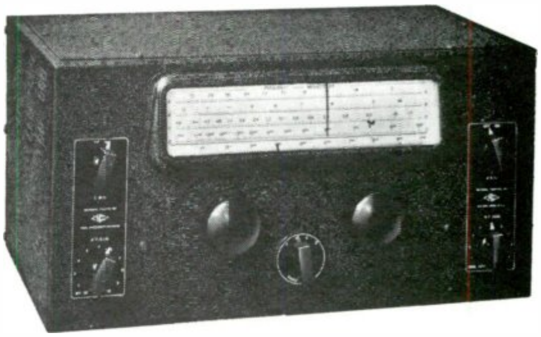
**MODEL:** HRO-50T1 **REMARKS:** Table model.



**MODEL:** HRO-60 **YRS:** 1952-64 **PRICE:** $483.50 (1952), $745 (1961) **BANDS:** 10, .05-54 mHz **TYPE:** Double conversion, variable hfo **IF:** 2010, 456 kHz **FILTER:** Crystal plus 12 455 kHc L/C circuits **TUBES:** 18, 2 6BA6 rf, 6BE6 mix, 6C4 hfo, 6BE6 conv2, 3 6SG7 if, 6H6 det/avc, 6H6 nl, 6SN7 phase inv/mtr amp, 6SJ7 af1, 2 6V6 p/p af out, 6SJ7 bfo, OB2 vr, 4H4C current reg, 5V4 rect **ANT IN:** 3 screw term, A, A, G, 50-300 Ω **AF OUT:** 8 W, 8/500 Ω **REMARKS:** Plug-in coils.



**MODEL:** NC-33 **YRS:** 1948-50 **PRICE:** $57.50 **BANDS:** 4, 0.5-35 mHz **IF:** 456 kHz **FILTER:** None **TUBES:** 6, 12SA7 conv, 12SG7 if, 12H6 det/avc/nl, 12SL7 af1/bfo, 35L6 af out, 35Z5 rect **ANT IN:** 3 screw term, 300 Ω **AF OUT:** 1.5 W, 3.4 Ω **REMARKS:** AC/DC, internal 5" speaker.

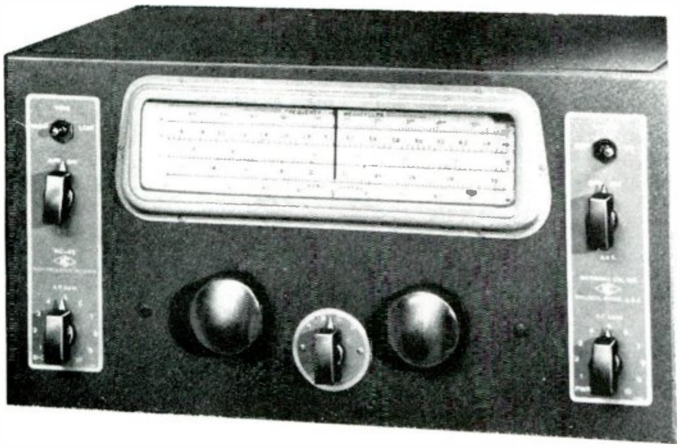


**MODEL:** NC-44 **YRS:** 1938-40 **PRICE:** $49.50 **IF:** 456 kHz **FILTER:** None **TUBES:** 7, 6K8 conv, 2 6L7 if, 6K7 det/avc, 6J7 bfo, 25L6 af out, 25Z5 rect **ANT IN:** 3 screw term, A, G, A **AF OUT:** 1.5 W to external out xfmr @ 1500 Ω, phones 20,000 Ω Z **REMARKS:** AC/DC.

**MODEL:** NC-44A **REMARKS:** Transformer operated, AC only version of NC-44.

**MODEL:** NC-44B **TUBES:** 6, 6K8 conv, 2 6L7 if, 6K7 det/avc, 6J7 bfo, 6V6 af out **REMARKS:** 6 V. battery operated version of NC-44.

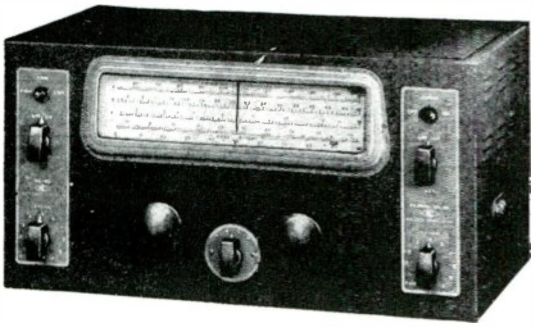
## NATIONAL



**MODEL:** NC-45 **YRS:** 1941-45 **PRICE:** $49.50 **BANDS:** 4, .55-30 mHz **FILTER:** None **IF:** 456 kHz **TUBES:** 8, 6K8 conv, 2 6L7 if, 6SQ7 det/avc/af1, 6H6 nl, 6J7 bfo, 25L6 af out, 25Z5 rect **ANT IN:** 3 screw term, A, G, A **AF OUT:** 1.5 W to external out xfmr @ 1500 Ω, phones 20.000 Ω Z **REMARKS:** AC/DC, NC-44 with added NL and new detector tube, other minor circuit changes.

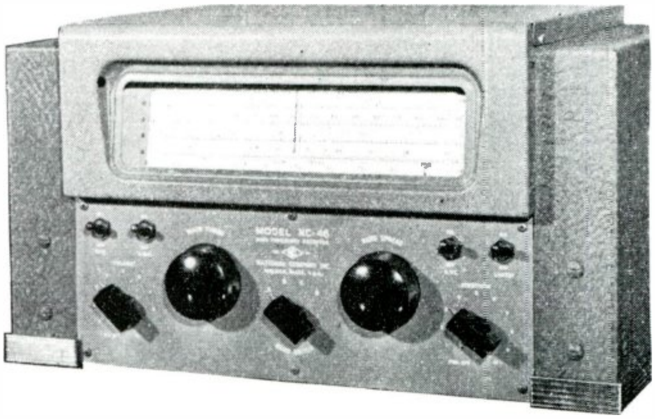
**MODEL:** NC-45A **REMARKS:** AC version of NC-45 with transformer operated power supply.

**MODEL:** NC-45B **TUBES:** 7, 6K8 conv, 2 6L7 if, 6SQ7 det/avc/af1, 6H6 nl, 6J7 bfo, 6V6 af out **REMARKS:** 6 V. battery operated version of NC-45.

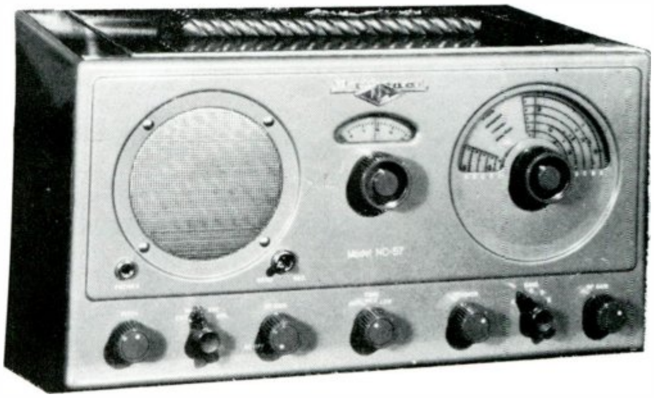


**MODEL:** NC-46 Prototype **REMARKS:** The receiver pictured above appeared in the 1946 ARRL Handbook. Childress believes pic was used in error and is actually an NC-45. Perhaps when the 46 Handbook went to press in late '45 they had not finished the design and just used the NC-45 picture.

## NATIONAL



**MODEL:** NC-46 **YRS:** 1945-47 **PRICE:** $107.40 **BANDS:** 4, .55-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 10, 6K8 conv, 2 6SG7 if, 6H6 det/nl, 6SF7 avc amp/rect. 6SJ7 bfo, 6SC7 af1/af inv, 2 25L6 p/p af out, 25Z5 rect **ANT IN:** 3 screw term, A, G, A, 500 Ω **AF OUT:** 3.4 Ω, 3 W. **REMARKS:** AC/DC.



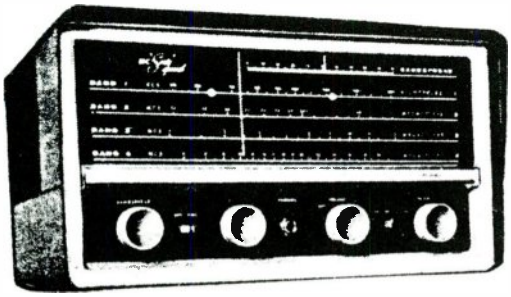
**MODEL:** NC-57 **YRS:** 1947-51 **PRICE:** $89.50 **BANDS:** 5, .54-55 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6SG7 rf, 6SB7Y conv, 2 6SG7 if, 6H6 det.avc/nl, 6SL7 af1/bfo, 6V6 af out, OD3 vr, 5Y3 rect **ANT IN:** 3 screw term, A, A, G, 300 Ω nom **AF OUT:** 3.4 Ω, 1.5 W. **REMARKS:** Internal 5" speaker.

**MODEL:** NC-57B **YRS:** 1951 **PRICE:** $99.50 **BANDS:** 5, .54-55 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6SG7 rf, 6SB7Y conv, 2 6SG7 if, 6H6 det/avc/nl, 6SL7 af1/bfo, 6V6 af out, VR150 vr, 5Y3 rect **REMARKS:** Changes: accessory socket wired for Select-O-Ject, minor circuit changes.

## NATIONAL

**MODEL:** NC-57C **BANDS:** 5, .19-.41, .54-34 mHz **REMARKS:** Same as NC-57B except frequency coverage.

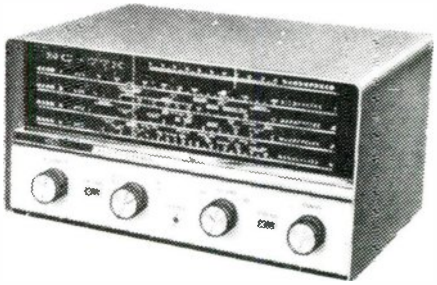
**MODEL:** NC-57M **YRS:** 1951 **BANDS:** 5, .19-.41, .54-34 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6SG7 rf, 6SB7Y conv, 2 6SG7 if, 6H6 det/avc/anl, 6SL7 af1/bfo, 25L6 af out, OA3/VR75 vr, 25Z6 rect **ANT IN:** 3 screw term, A, A, G, 300 Ω nom **AF OUT:** 3.4 Ω, 1.5 W. **REMARKS:** AC/DC.



**MODEL:** NC-60 "Special" **YRS:** 1958-61 **PRICE:** $59.95 **BANDS:** 4, .54-31 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 5, 12BE6 conv, 12BA6 if/bfo, 12AV6 det/avc/af1, 50C5 af out, 35W4 rect **ANT IN:** 2 screw term, 50-300 Ω **REMARKS:** Internal 5" speaker, AC/DC. Restyled, redesigned SW-54.

**MODEL:** NC-66 **YRS:** 1957-61 **PRICE:** $129.95 **BANDS:** 5, .15-.4, .5-23 mHz **FILTER:** None **TUBES:** 5 + sel rect, 1U4 rf, 1L6 conv, 1U4 if/bfo, 1U5 det/avc/nl, 3V4 af out, sel rect **ANT IN:** Ferrite loop bands 1 & 2, whip bands 3-5, ext unbal term 50-300 Ω **REMARKS:** AC/DC/battery, internal speaker.

## NATIONAL



**MODEL:** NC-77X **YRS:** 1964 **PRICE:** $69.95 **BANDS:** 4, .54-31 mHz **REMARKS:** Internal 5" speaker.

OFF ON
SEND
OFF
REC
AVC
ON OFF

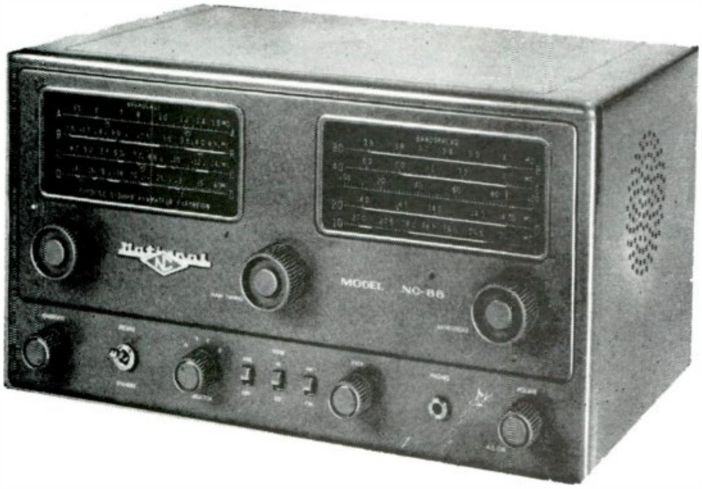
**MODEL:** NC-80X **YRS:** 1937-38 **PRICE:** $88.00 **BANDS:** 4, .55-30 mHz **IF:** 1560 kHz **FILTER:** Crystal **TUBES:** 10, 6L7 mix, 6J7 hfo, 3 6K7 if, 6C5 det, 6B8 avc, 6J7 bfo, 25L6 af out, 25Z5 rect **ANT IN:** Bal/unbal **AF OUT:** 2 W, ext out xfmr **REMARKS:** AC/DC, direct reading dial, movable coil rack.

**MODEL:** NC-80XB **TUBES:** 9 **REMARKS:** Battery version of NC-80X, 6 V heater, 135 V B+. Uses 6V6 af out, no rectifier.

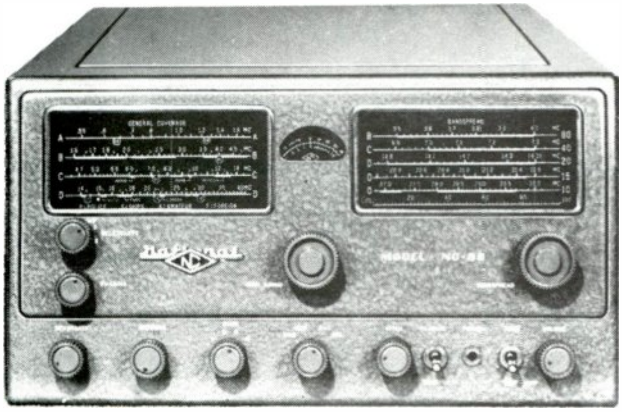
SELECTIVITY
OFF ON
OFF ON
AVC

**MODEL:** NC-81X **YRS:** 1937-39 **PRICE:** $88.00 **BANDS:** 5, 160, 80, 40, 20, 10 mtr ham bands **REMARKS:** Ham band model of NC-80X.

**MODEL:** NC-81XB **REMARKS:** Battery model of NC-81X.

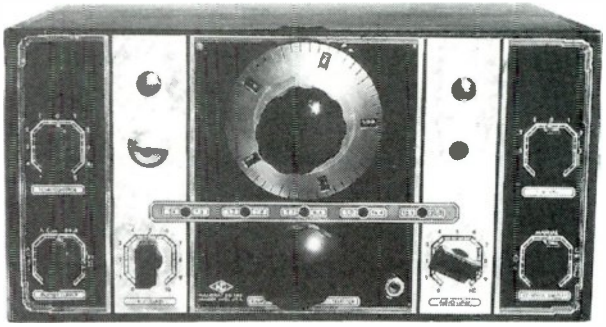


**MODEL:** NC-88 World Master **YRS:** 1953-56 **PRICE:** $119.95 **BANDS:** 4, .54-40 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 6BA6 rf, 6BE6 mix, 6C4 hfo, 2 6BD6 if, 6AL5 det/avc/nl, 12AX7 af1/bfo, 6AQ5 af out, 5Y3 rect **AF OUT:** 1.5 W, 3.2 Ω **REMARKS:** Internal 5" speaker. NC-98 without crystal and "S" meter, successor to NC-57.



**MODEL:** NC-98 **YRS:** 1954-56 **PRICE:** $149.95 **BANDS:** 4, .55-40 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 9, 6BA6 rf, 6BE6 mix, 6C4 hfo, 2 6BD6 if, 6AL5 det/avc/nl, 12AX7 af1/bfo/mtr amp, 6AQ5 af out, 5Y3 rect **AF OUT:** 1.5 W, 3.2 Ω **REMARKS:** NC-88 with added xtal and "S" meter.

**MODEL:** NC-98SW **REMARKS:** NC-98 with bandspread scales calibrated for SW BC bands.



Courtesy Wayne Childress and *Old Timers Bulletin*

**MODEL:** NC-100 **YRS:** 1936-38 **PRICE:** $105 **BANDS:** 5, .54-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 12, 6K7 rf, 6J7 mix, 6K7 hfo, 2 6K7 if, 6C5 det, 6J7 bfo, 6J7 avc, 6E5 tun eye, 2 6F6 p/p af out, 80 rect **ANT IN:** 2 binding posts, gnd wire, bal/unbal **AF OUT:** 10 W, 500 Ω to dyn spkr **REMARKS:** PW dial, movable coil rack, tuning eye.

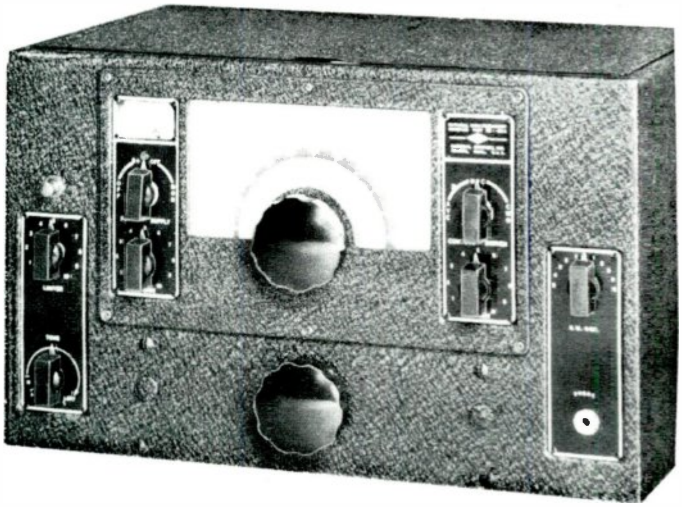
**MODEL:** NC-100 (Battery) **TUBES:** 10, 6K7 rf, 6J7 mix, 6K7 hfo, 2 6K7 if, 6C5 det, 6J7 bfo, 6J7 avc, 6E5 tun eye, 6F6 af out **AF OUT:** 2 W. **REMARKS:** Battery model, operates on B+ of 180 V. at 35 mA.

**MODEL:** NC-100A **YRS:** 1938-45 **PRICE:** $120 **BANDS:** 5, .54-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 11, 6K7 rf, 6J7 mix, 6K7 hfo, 2 6K7 if, 6C8 det/nl, 6J7 bfo, 6F8 af1/avc, 2 6F6 p/p af out, 80 rect **ANT IN:** 2 binding posts, gnd wire, bal/unbal **AF OUT:** 10 W, 500 Ω to dyn spkr **REMARKS:** New cabinet, "S" meter in place of eye, direct reading dial in place of PW, new tone control. See NC-100XA for pic.

**MODEL:** NC-100A (Special) **BANDS:** 5, 0.2-0.4, 1.3-30 mHz **REMARKS:** NC-100A with low frequency band.

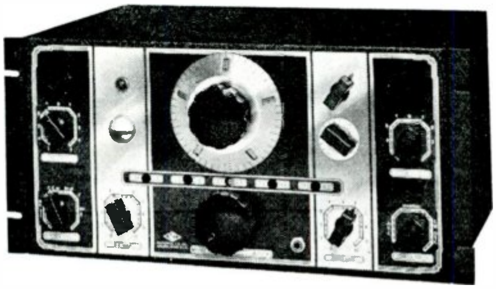
**MODEL:** NC-100ASC **REMARKS:** GRR-3

## NATIONAL



**MODEL:** NC-100ASD **BANDS:** 5, 0.2-0.4, 1.3-30 mHz **IF:** 456 kHz **FILTER:** None **TUBES:** 10, 6K7 rf, 6J7 mix, 6J7 hfo, 2 6K7 if, 6C8 det/nl, 6F8 af1/avc, 6J7 bfo, 6V6 af out, 5Z3 rect **ANT IN:** 2 binding posts, gnd wire, bal/unbal **AF OUT:** 2 W, 500 Ω to dyn spkr **REMARKS:** NC-100A (special) built to Signal Corps standards. Available for either 115 V., 50/60 Hz or 115 V., 25 Hz.

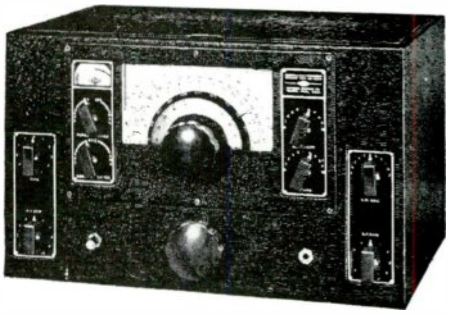
**MODEL:** NC-100S **REMARKS:** Special NC-100 with 12" speaker (vs 10")



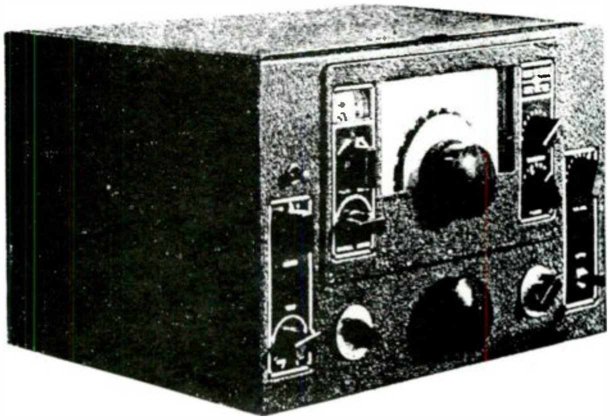
**MODEL:** NC-100X **PRICE:** $127.50 **FILTER:** Crystal **REMARKS:** NC-100 with crystal filter.

**MODEL:** NC-100X (Battery) **FILTER:** Crystal **REMARKS:** NC-100 (Battery) with crystal filter.

## NATIONAL



**MODEL:** NC-100XA **PRICE:** $142.50 **FILTER:** Crystal **REMARKS:** NC-100A with crystal filter.

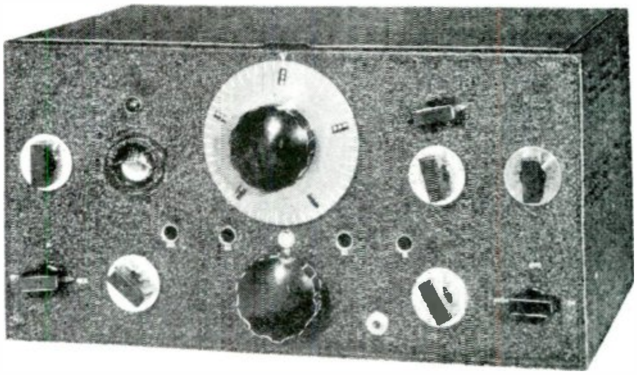


**MODEL:** NC-100XA (Variation) **REMARKS:** Note additional control and different placement of controls.

**MODEL:** NC-100XA (Special) **BANDS:** 5, 0.2-0.4, 1.3-30 mHz **REMARKS:** NC-100XA with low frequency band.

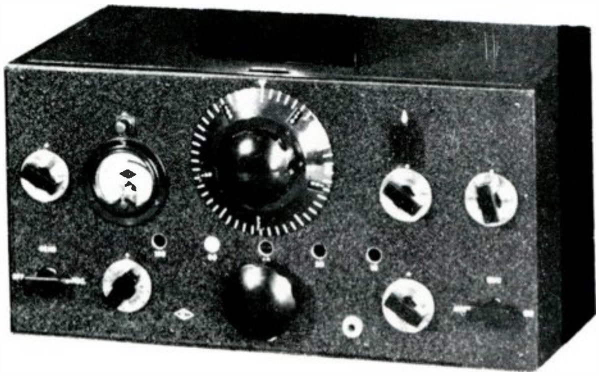
**MODEL:** NC-100XS **REMARKS:** Special NC-100X with 12" speaker (vs 10").

**MODEL:** NC-100XAM **REMARKS:** No information available.



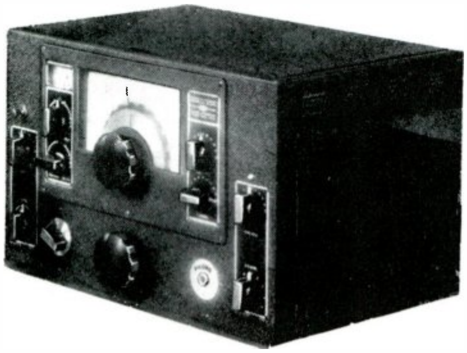
## NATIONAL

**MODEL:** NC101X **YRS:** 1936-39 **PRICE:** $125 **BANDS:** 5, 160, 80, 40, 20, 10 mtr ham bands **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 12, 6K7 rf, 6J7 mix, 6K7 hfo, 2 6K7 if, 6C5 det, 6J7 avc, 6J7 bfo, 2 6F6 p/p af out, 6E5 tun eye, 80 rect **ANT IN:** 2 binding posts, gnd wire, bal/unbal **AF OUT:** 10 W, 500 Ω to dyn spkr **REMARKS:** Ham band only version of NC-100. PW dial, movable coil catacomb, tuning eye.



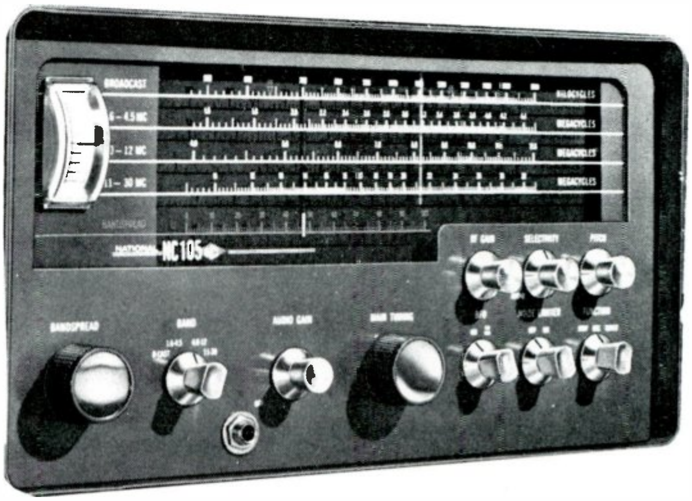
**MODEL:** NC-101X (Variation) **REMARKS:** "S" meter replaces tuning eye, adds push-pull "S" meter switch.

**MODEL:** NC-101X (Battery) **TUBES:** 10, 6K7 rf, 6J7 mix, 6K7 hfo, 2 6K7 if, 6C5 det, 6J7 avc, 6J7 bfo, 6F6 af out, 6E5 tun eye **REMARKS:** Battery version of NC-101X. Operates from B+ of 180 V. at 35 mA.



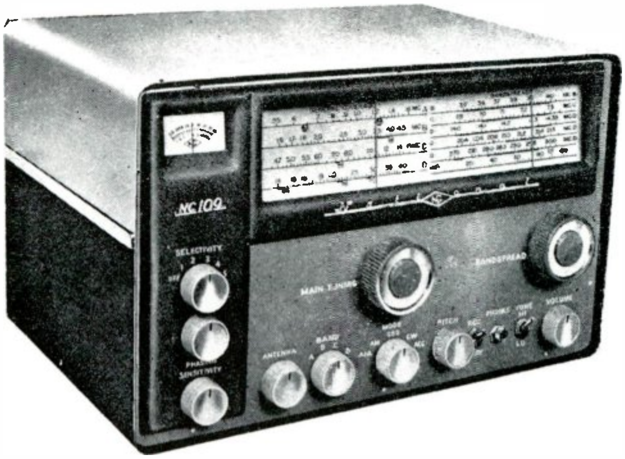
**MODEL:** NC-101XA **YRS:** 1939-41 **PRICE:** $129 **BANDS** 5, 160, 80, 40, 20, 10 mtr ham bands **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 11, 6K7 rf, 6J7 mix, 6K7 hfo, 2 6K7 if, 6C8 det/nl, 6J7 bfo, 6F8 af1/avc, 2 6F6 p/p af out, 80 rect **ANT IN:** binding posts, gnd wire, bal/unbal **AF OUT:** 10 W, 500 Ω to dyn spkr **REMARKS:** Ham band only version of NC-100A New direct reading dial, noise limiter, "S" meter. Retains movable coil catacomb.

## NATIONAL



**MODEL:** NC-105 **YRS:** 1962-63 **PRICE:** $119.95 **BANDS:** 4, .55-30 mHz **IF:** 455 kHz **FILTER:** Regenerative if **TUBES:** 6, 6BE6 conv, 2 6BA6 if, 6T8 det/anl/af1, 6AW8 det/bfo/af out, 6X4 rect **ANT IN:** 2 screw term, 50-300 Ω unbal **AF OUT:** 3.2 Ω to int spkr **REMARKS:** Internal 5" speaker.

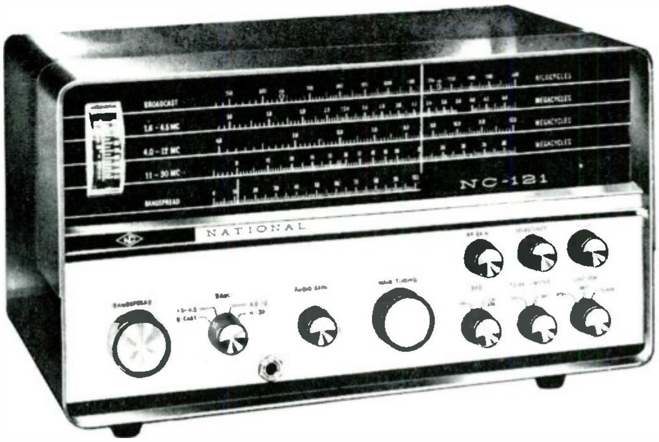
**MODEL:** NC-105W **REMARKS:** NC-105 in walnut cabinet.



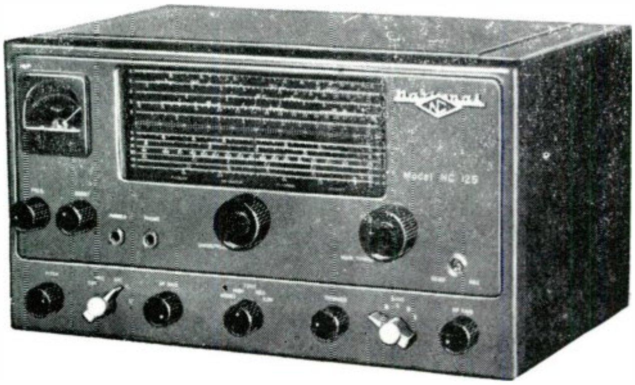
**MODEL:** NC-109 **YRS:** 1957-60 **PRICE:** $199.95 **BANDS:** 4, .54-40 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 11, 6BA6 rf, 6BE6 mix, 6C4 hfo, 2 6BA6 if, 6AL5 det/avc/nl, 6BE6 prod det, 12AT7 af1/bfo/meter amp, 6AQ5 af out, OB2 vr, 5Y3 rect **ANT IN:** 3 screw term, 50-300 Ω, bal/unbal **AF OUT:** 1.5 W, 3.2 Ω.

## NATIONAL

**MODEL:** NC-120 **REMARKS:** Similar to RAO (q.v.).

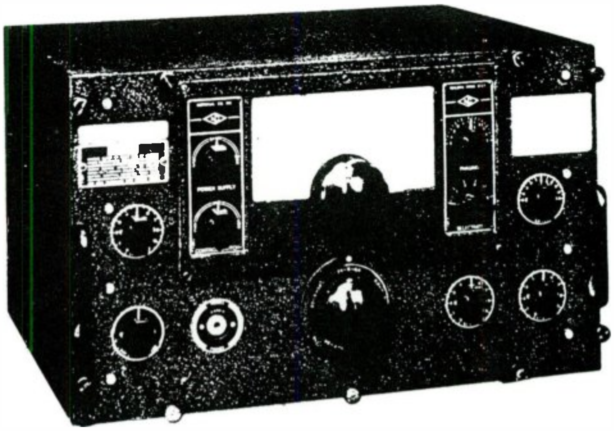


**MODEL:** NC-121 **YRS:** 1963-66 **PRICE:** $129.95 **BANDS:** 4, .54-30 mHz **FILTER:** Q multiplier **TUBES:** 6, 6BE6, 2 6BA6, 6T8, 6AW8, 6X8 **REMARKS:** Internal 5" speaker.



**MODEL:** NC-125 **YRS:** 1950-55 **PRICE:** $149.50 **BANDS:** 4, .55-36 mHz **FILTER:** None **TUBES:** 11, 6SG7 rf, 6SB7Y conv, 2 6SG7 if, 6H6 det/avc/anl, 6SL7 af1/bfo, 6V6 af out, 6SL7 phase shift, 6SL7 boost-rej, 0A2 vr, 5Y3 rect **ANT IN:** 3 screw term, 50-300 Ω **AF OUT:** 1.5 W, 3.2 Ω **REMARKS:** Built-in Select-O-Ject.

## NATIONAL



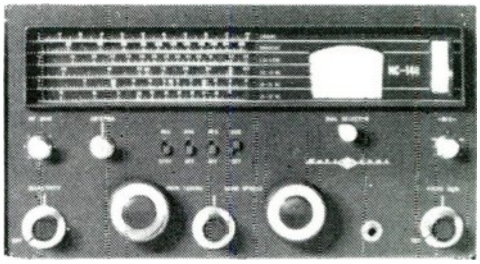
Courtesy Ken Hopper, K2VAM

**MODEL:** NC-127 **YRS:** WWII **BANDS:** 4, .54-30 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 11, 2 6K7 rf, 6J7 bfo, 6F8 hfo, 2 6K7 if, 6C8 det/nl, 6J7 bfo, 6F8 af1/avc, 6V6 af out, 5Z3 rect **ANT IN:** MIL coax conn, unbal **AF OUT:** 3 W, 600 Ω **REMARKS:** Low radiation receiver with additional RF stage added on the back. Similar to NC-100XA. Compare with RAO.

**MODEL:** NC-127D **YRS:** 1945 **REMARKS:** Special NC-127 used in an experimental triple diversity system. Only one system (3 receivers) made. Receivers had a two position DIVERSITY control and a DIVERSITY IF GAIN CONTROL.

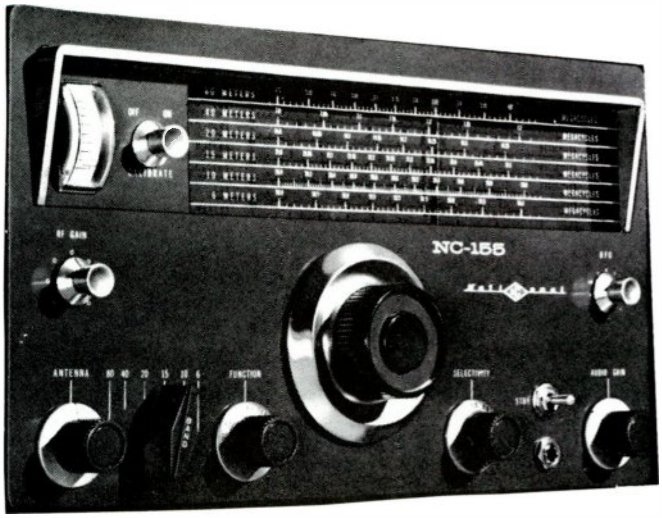
**MODEL:** NC-1-39 **BANDS:** 5, .54-30 mHz **FILTER:** Crystal **TUBES:** 9, 6K7 rf, 6J7 1st det, 6J7 hfo, 2 6K7 if, 6C5 2nd det, 6J7 avc, 6J7 bfo, 80 rect **AF OUT:** 40 mW. **REMARKS:** Manual shows receiver tagged as "NC-100XA," but has two headphone jacks. Receiver intended for headphone use.

**MODEL:** NC-1-39S **BANDS:** 5, .2-.4, .495-1.060, and 1.3-14.4 mHz **REMARKS:** Receiver same as NC-1-39, except for band coverage. This unit is intended for vlf and direction finding uses.



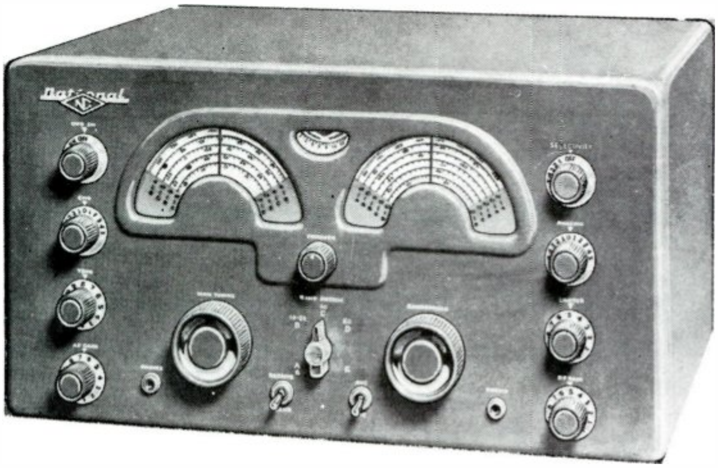
## NATIONAL

**MODEL:** NC-140 **YRS:** 1963-64 **PRICE:** $189.95 **BANDS:** 5, .54-30 mHz **TYPE:** Double conversion, tunable HFO **FILTER:** Q multiplier **TUBES:** 8, 6BZ6 rf, 12BA6 if, 12BE6 conv1, 12BE6 conv2, 6BN8 bfo/anl, 12AV6 det/af1, 6CW5 af out, 5Y3 rect **REMARKS:** Dual bandspread dials for ham and SWL.



**MODEL:** NC-155 **YRS:** 1961-63 **PRICE:** $199.95 **BANDS:** 6, 80, 40, 20, 10, 6 mtr ham bands **TYPE:** Double conversion, tunable HFO **IF:** 2215, 230 kHz **FILTER:** 230 kHz L/C **TUBES:** 10, 6BZ6 rf, 6BE6 conv1, 6BE6 conv2, 2 6BA6 if, 6T8 det/agc/nl/af1, 12AX7 prod det/bfo, 6CW5 af out, 0B2 vr, 5Y3 rect **ANT IN:** 2 screw term **AF OUT:** 1 W, 3.2 Ω **REMARKS:** Ham band version of the NC-190.

**MODEL:** NC-156 **BANDS:** 5, 0.3-1.2, 1.7-16 mHz **IF:** 1500 kHz **REMARKS:** Navy NC-100A with two RF stages and 1500 kHz IF. Reference RBH.

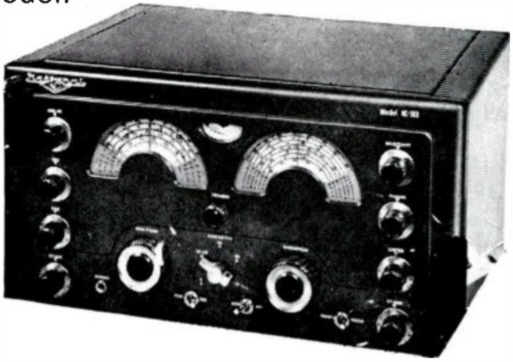


## NATIONAL

**MODEL:** NC-173 **YRS:** 1947-1951 **PRICE:** $189.50 **BANDS:** 5, .54-31, 48-56 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 13, 6SG7 rf, 6SA7 mix, 6J5 hfo, 2 6SG7 if, 6H6 det/avc, 6H6 nl, 6SJ7 af1, 6AC7 avc amp, 6SJ7 bfo, 6V6 af out, 0D3 vr, 5Y3 rect **ANT IN:** 3 screw term, 500 Ω nom **AF OUT:** 3.5 W, 8/500 Ω.

**MODEL:** NC-173R **REMARKS:** Rack model.

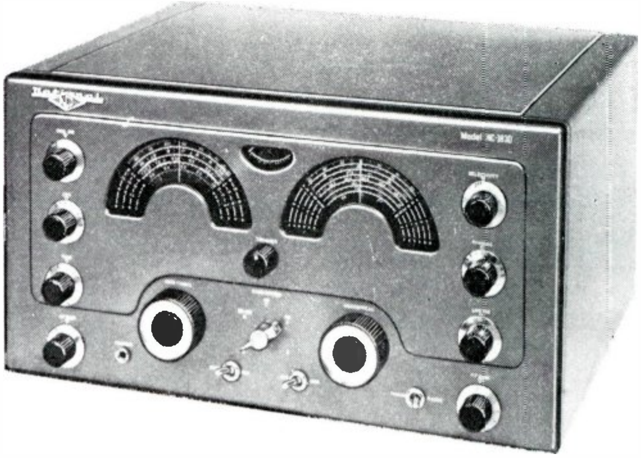
**MODEL:** NC-173T **REMARKS:** Table model.



**MODEL:** NC-183 **YRS:** 1947-52 **PRICE:** $269 **BANDS:** 5, .54-31, 48-56 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 16, 2 6SG7 rf, 6SA7 mix, 6J5 hfo, 2 6SG7 if, 6H6 det/avc, 6SJ7 bfo, 6AC7 avc amp, 6H6 nl, 6SJ7 af1, 6J5 phase inv, 2 6V6 p/p af out, VR-150 vr, 5U4 rect **ANT IN:** 3 screw term, 300 Ω nom **AF OUT:** 8 W, 8/500 Ω.

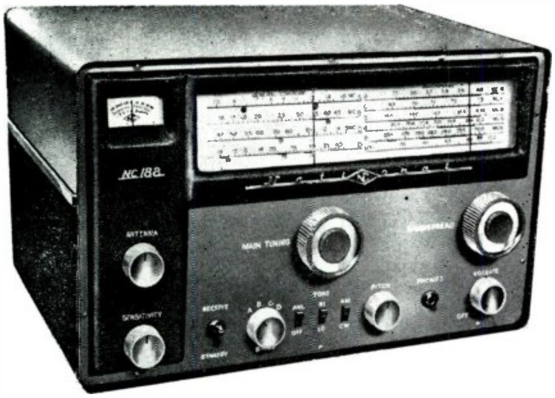
**MODEL:** NC-183R **REMARKS:** Rack model.

**MODEL:** NC-183T **REMARKS:** Table model.

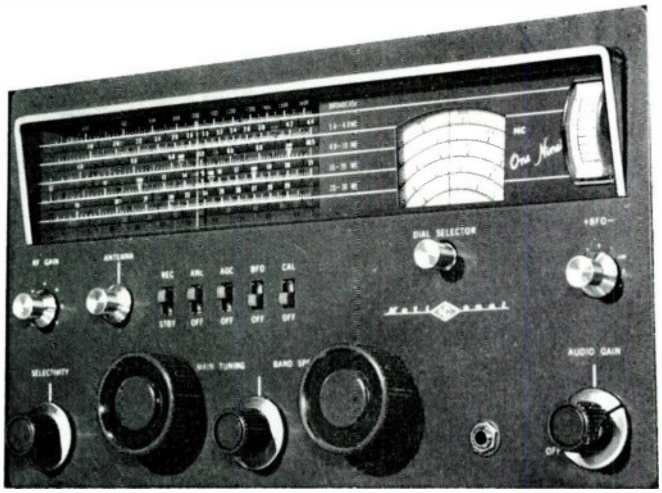


## NATIONAL

**MODEL:** NC-183D **YRS:** 1952-58 **PRICE:** $369.50 **BANDS:** 5, .54-55 mHz **TYPE:** Double conversion, tunable HFO **IF:** 1720, 455 kHz **FILTER:** Crystal **TUBES:** 17, 2 6BA6 rf, 6BE6 conv1, 6BE6 conv2, 3 6BA6 if, 6AL5 det/avc, 6AH6 avc amp, 6SJ7 bfo, 6AL5 nl, 6SJ7 af1, 6SN7 phase inv/mtr amp, 2 6V6 p/p af out, 0B2 vr, 5U4 rect **ANT IN:** 3 screw term, 300 Ω nom **AF OUT:** 8 W, 8/500 Ω **REMARKS:** Dual conversion, new crystal filter, new noise limiter, better sensitivity, miniature tubes.

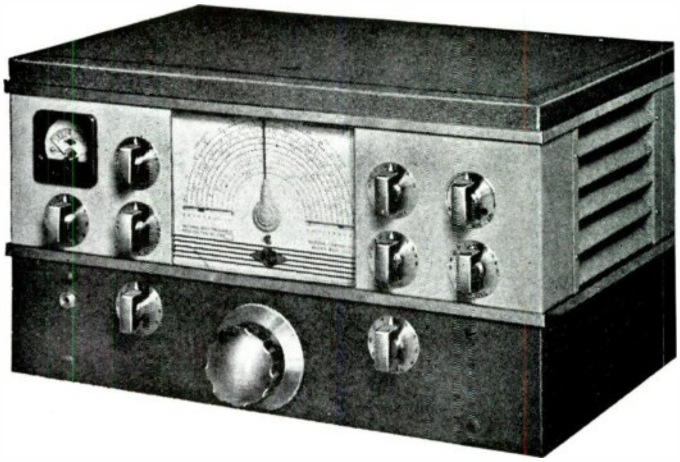


**MODEL:** NC-188 **YRS:** 1957-59 **PRICE:** $159.95 **BANDS:** 4, .54-40 mHz **FILTER:** None **TUBES:** 9, 6BA6 rf, 6BE6 mix, 6C4 hfo, 2 6BA6 if, 6AL5 det/avc/anl, 12AT7 af1/bfo, 6AQ5 af out, 5Y3 rect **ANT IN:** 3 screw term, 50-300 Ω **AF OUT:** 1.5 W.



## NATIONAL

**MODEL:** NC-190 **YRS:** 1961-64 **PRICE:** $199.50 **BANDS:** 5, .54-30 mHz **TYPE:** Double conversion, tunable HFO **IF:** 2215, 230 kHz **FILTER:** 230 kHz L/C **TUBES:** 10, 6BZ6 rf, 6BE6 conv1, 6BE6 conv2, 2 6BA6 if, 6T8 det/agc/nl/af1, 12AX7 prod det/bfo, 6CW5 af out, 0B2 vr, 5Y3 rect **ANT IN:** Phono jack, 2 screw term, 50 Ω unbal **AF OUT:** 1 W, 3.2 Ω **REMARKS:** Selectable SWL or ham bandspread.

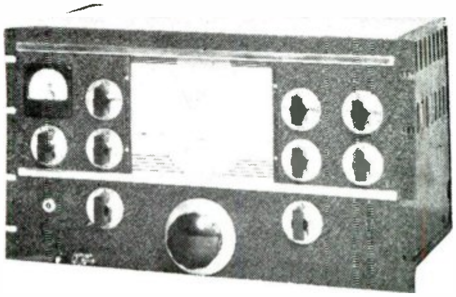


**MODEL:** NC-200 **YRS:** 1940-43 **PRICE:** $147.50 **BANDS:** 10, 6 general coverage bands .49-30 mHz, 4 ham bands 10, 20, 40, 80 mtrs **FILTER:** Crystal **TUBES:** 12, 6SK7 rf, 6K8 mix, 6J5 hfo, 6K7 if1, 6SK7 if2, 6C8 det/nl, 6SJ7 bfo, 6F8 af1/phase inv, 2 6V6 p/p af out, 5Y3 rect, 6SJ7 avc **AF OUT:** 8 W. **REMARKS:** Ten range calibrated dial, movable coil catacomb.

**MODEL:** NC-200RG **REMARKS:** Rack model.

**MODEL:** NC-200TG **REMARKS:** Table model.

**MODEL:** NC-200TGM **REMARKS:** NC-200TG without amateur bandspread.

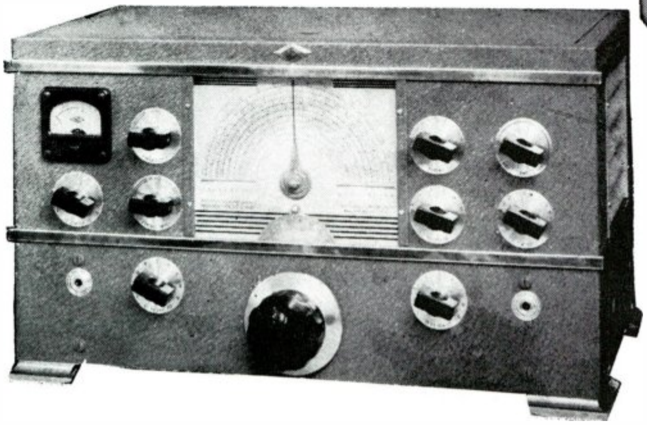


## NATIONAL

**MODEL:** NC-2-40 **YRS:** 1943-44 **PRICE:** $169.50 **BANDS:** 6, .49-30 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 13, 6SK7 rf, 6K8 mix, 6J5 hfo, 6K7 if1, 6SK7 if2, 6C8 det/nl, 6SJ7 bfo, 6SJ7 avc amp, 6J5 af1, 6F8 phase inv, 2 6V6 p/p af out, 80 rect **ANT IN:** 500 Ω, bal/unbal **AF OUT:** 6 W, 8/500 Ω **REMARKS:** Successor to NC-200, movable coil catacombs.

**MODEL:** NC-2-40C **YRS:** 1945-46 **PRICE:** $225 **BANDS:** 6, .49-30 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 12, 6SK7 rf, 6K8 mix, 6J5 hfo, 6K7 if1, 6SK7 if2, 6SL7 det/nl, 6SJ7 bfo, 6SN7 af1/inv, 2 6V6 p/p af out, 5Y3 rect, 6SJ7 avc **ANT IN:** 500 Ω, bal/unbal **AF OUT:** 8 W, 10,000 Ω to ext out xfmr.

**MODEL:** NC-2-40CS **BANDS:** 6, 0.2-0.4, 1-30 mHz **AF OUT:** 8 W, 8/500 Ω **REMARKS:** Same as NC-2-40C except frequency coverage and AF OUT.



## NATIONAL

**MODEL:** NC-2-40D **YRS:** 1946-49 **PRICE:** $225 **BANDS:** 10 bands, 80, 40, 20, 10 mtr ham bands, 6 general coverage .49-30 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 12, 6SK7 rf, 6K8 mix, 6J5 hfo, 6K7 if1, 6SK7 if2, 6SL7 det/nl, 6V6 avc, 6SJ7 bfo, 6SN7 phase inv, 2 6V6 p/p af out, 5Y3 rect **ANT IN:** 2 binding posts, gnd wire, 500 Ω bal/unbal **AF OUT:** 8 W, 10,000 Ω to ext out xfmr **REMARKS:** Movable coil catacombs. Adds 4 amateur bandspread bands.

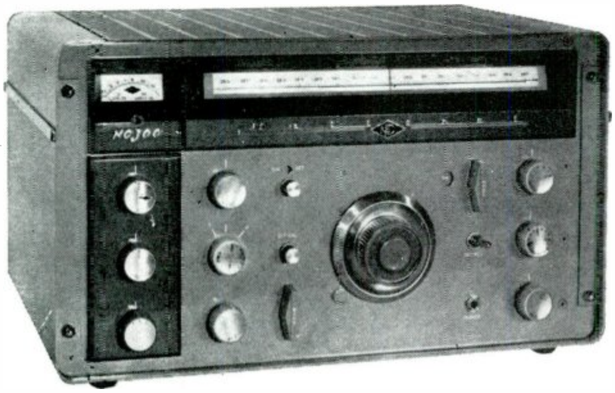
**MODEL:** NC-2-40DR **REMARKS:** Rack model.

**MODEL:** NC-2-40DT **REMARKS:** Table model.

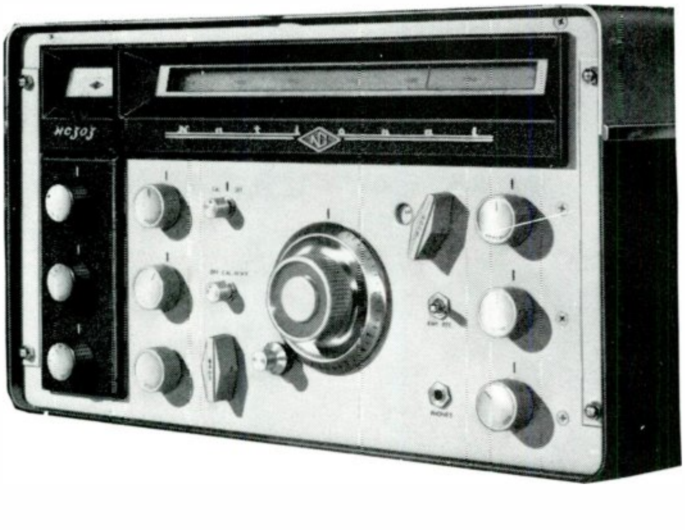
**MODEL:** NC-2-40S **PRICE:** $189.50 **BANDS:** 6, 0.2-18 mHz **REMARKS:** Same as NC-2-40 except frequency coverage.

National
NC-
two Seventy
RF GAIN
DEPTH
NOTCH
BFO
SELECTIVITY
AUDIO GAIN
ANTENNA
FUNCTION
STBY
MC

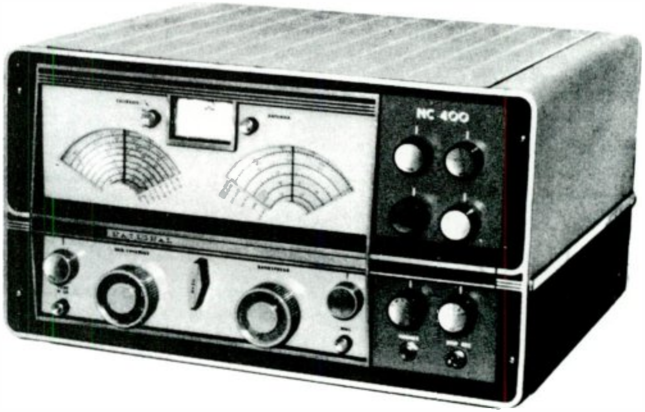
**MODEL:** NC-270 **YRS:** 1960-64 **PRICE:** $249.95 **BANDS:** 6, 80, 40, 20, 15, 10, 6 mtrs **TYPE:** Double conversion, tunable HFO **IF:** 2215, 230 kHz **FILTER:** 230 kHz L/C "ferrite filter" **TUBES:** 10, 6BZ6 rf, 6BE6 conv1, 6BE6 conv2, 2 6BA6 prod det, 12AU7 calib/bfo, 6T8 det/avc/anl/af1, 6CW5 af out, 0B2 vr, 5Y3 rect **ANT IN:** Phono jack, 2 screw term, 50 Ω unbal **AF OUT:** 3 W, 3.2 Ω **REMARKS:** Cabinet color, "Cosmic Blue."



**MODEL:** NC-300 **YRS:** 1955-58 **PRICE:** $349.95 **BANDS:** 7, 10-160 mtr ham bands plus 3 positions, 5 mHz wide, for 1¼, 2 and 6 mtr converters. **TYPE:** Double conversion, tunable HFO **IF:** 2215, 80 kHz **FILTER:** 2215 kHz crystal and 80 kHz L/C **TUBES:** 13, 6BZ6 rf, 6BA7 mix, 6AH6 hfo, 6BE6 mix2/xco, 2 6BJ6 if, 6AL5 det/anl, 6BE6 prod det/bfo, 12AT7 af1/mtr amp, 6AQ5 af out, 4H4-C curr reg, 0B2 vr, 5Y3 rect **ANT IN:** 3 screw term, 50-300 Ω, phono jack conv input **AF OUT:** 1 W, 8 Ω **REMARKS:** Optional 1¼, 2, 6 meter converters. Ad says, "Massive in the modern manner."



**MODEL:** NC-303 **YRS:** 1958-62 **PRICE:** $449.95 **BANDS:** 7, 10-160 mtr ham bands plus 3 positions, 5 mHz wide, for 1¼, 2 and 6 mtr converters. **TYPE:** Double conversion, tunable HFO **IF:** 2215, 80 kHz **FILTER:** 80 kHz L/C, Q multiplier **TUBES:** 15, 6BZ6 rf, 6BA7 mix, 6AH6 hfo, 6BE6 mix2/xco, 2 6BJ6 if, 6AL5 det/anl, 6BE6 prod det/bfo, 6AL5 ssb-cw nl, 12AT7 af1/mtr amp, 12AX7 Q mult, 6AQ5 af out, 4H4-C curr reg, 0B2 vr, 5Y3 rect **ANT IN:** 3 screw term, 70 Ω nom **AF OUT:** 1 W, 8 Ω **REMARKS:** Changes from NC-300: eliminated 2215 kHz crystal filter, added 80 kHz Q mulitplier, new SSB/CW noise limiter, improved AVC.

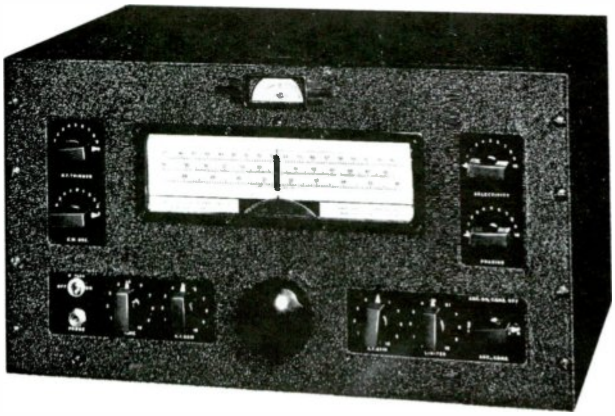


Tnx Jay Spivack, N7JDT and *Electric Radio*

**MODEL:** NC-400 **YRS:** 1959-64 **PRICE:** $895 **BANDS:** 7, .54-31 mHz **TYPE:** Double conversion, tunable HFO **IF:** 1720, 455 kHz **FILTER:** Crystal, optional mechanical filters **TUBES:** 18, 2 6BZ6 rf, 6BE6 mix1(1720 kHz), 6BE6 mix1(455 kHz), 6BZ7 hfo/fix chan xco, 6BE6 mix2/xco, 3 6BA6 if, 6AL5 det/avc/anl, 6BE6 prod det, 6U8 bfo, 6AL5 mnl, 12AT7 af1/mtr amp, 6AQ5 af out, 4H4-C curr reg, 0B2 vr, 5Y3 rect **ANT IN:** S0239, 52 Ω **AF OUT:** 1 W, 3.2/600 Ω **REMARKS:** Provision for five crystal controlled channels.

## NATIONAL

**MODEL:** NC-510 **YRS:** 1938 **PRICE:** $150 **BANDS:** 3, 28-60 mHz **IF:** 1560 kHz **FILTER:** None **TUBES:** 956 rf, 954 mix, 955 hfo, others unknown **ANT IN:** Screw term, 70 Ω nom **AF OUT:** 2 W. **REMARKS:** Rotary turret coil changing. Replaced by NHU.

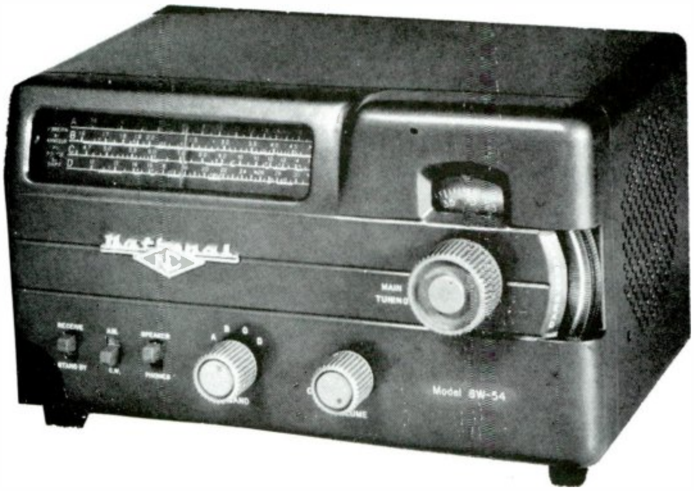


**MODEL:** NHU **YRS:** 1939-42 **PRICE:** $275 **BANDS:** 3, 27.5-62 mHz **IF:** 1560 kHz **FILTER:** Crystal **TUBES:** 12, 956 rf, 954 mix, 955 hfo, 3 6K7 if, 6H6 det/nl, 6SJ7 bfo, 6SJ7 avc, 6C8 cons, 6C8 af1, 6V6 af out **AF OUT:** 2 W. **REMARKS:** Sucessor to the NC-510. Rotary turret coil switching.

**MODEL:** NHU-B **REMARKS:** NHU for 6 volt battery operation.

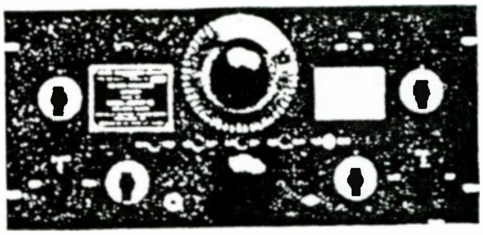
**MODEL:** NHU-20 **REMARKS:** NHU with 20 meter coil.

**MODEL:** NHU-20B **REMARKS:** NHU-20 for 6 volt battery operation.



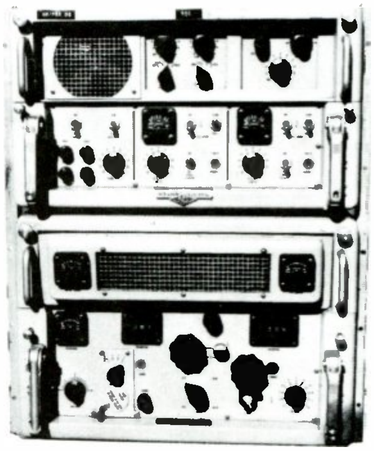
## NATIONAL

**MODEL:** SW-54 **YRS:** 1951-58 **PRICE:** $49.95 ($59.95 '56) **BANDS:** 4, .54-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 5, 12BE6 conv, 12BA6 if/bfo, 12AV6 det/avc/af1, 50C5 af out, 35Z5 rect **ANT IN:** Screw term, 50-300 Ω **AF OUT:** 1.8 W. **REMARKS:** AC/DC, internal speaker.



**MODEL:** NRCL **YRS:** 1944-45 **REMARKS:** Part of NCRM dual diversity system. PW dial, movable coil catacombs.

**MODEL:** BC-903-A **YRS:** WW II **BANDS:** 0.54-30 mHz **FILTER:** None **REMARKS:** Navy version of NC-100A.



**MODEL:** FRR-59A **BANDS:** 4, 2-32 mHz **TYPE:** Triple conversion, fixed HFO **IF:** 1625-1725, 220, 80 kHz **TUBES:** 64 plus 24 semi diodes (See WRR-2) **REMARKS:** AM/SSB/CW, digital readout, similar to WRR-2, q.v., but not mechanically interchangeable.

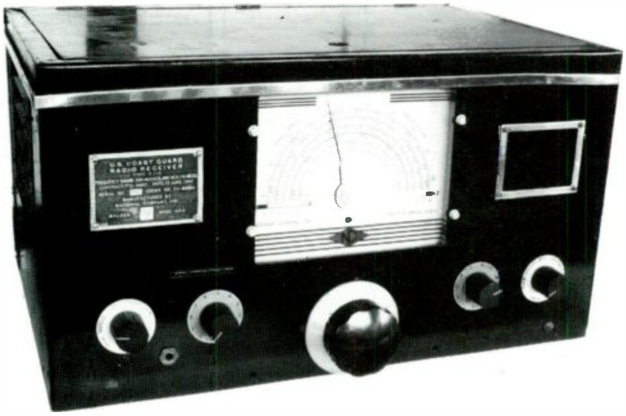
**MODEL:** GRR-3 **YRS:** WW II **REMARKS:** NC-100ASC.

**MODEL:** R-106 **YRS:** WW II **REMARKS:** HRO (Variation 4) made for British Army.

## NATIONAL

**MODEL:** R-106 MK I **REMARKS:** HRO-M made for British Army.

**MODEL:** R-106 MK II **REMARKS:** HRO-W made for British Army.

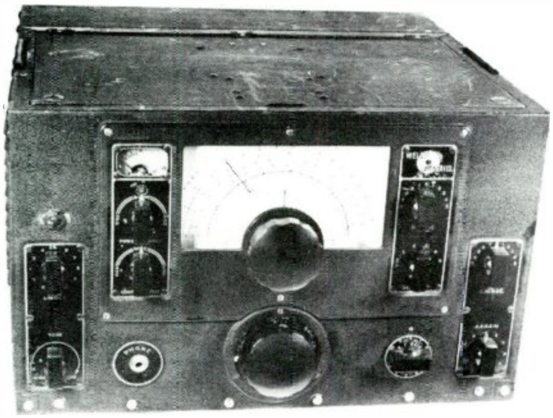


Courtesy Bob Hopkins

**MODEL:** R-115 **YRS:** WW II **BANDS:** 6, 0.2-0.4, .49-18 mHz **FILTER:** None **TUBES:** 13, 4 117N7, 3 12SK7, 12K8, 12J5, 12SC7, 12C8, 12SR7, 12SJ7 **ANT IN:** 2 binding posts, gnd wire **REMARKS:** AC/DC, similar to NC-200 but less bandspread and crystal filter. Made for US Coast Guard.

**MODEL:** R-140 **REMARKS:** HRO-5.

**MODEL:** R-211 **REMARKS:** HRO (Variation 5).



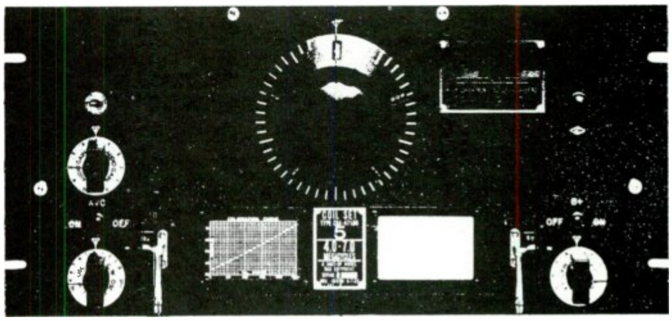
Courtesy *Antique Radio Classified* and Henry Rogers

RAO-5

## NATIONAL

**MODEL:** RAO **YRS:** 1938 **BANDS:** 5, .54-30 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 10, 6K7 rf, 6J7 1st det, 6J7 hfo, 2 6K7 if, 6C5 2nd det, 6J7 avc, 6J7 bfo, 6V6 af out, 80 rect **AF OUT:** 2 W. **REMARKS:** US Navy designation is CNA-46072. Contractor listed as GE, but manufactured by National. This early version does not have the added rf stage welded on the back.

**MODEL:** RAO-1 thru -8 **YRS:** WW II **BANDS:** 5, .54-30 mHz **FILTER:** Crystal **IF:** 455 kHz **TUBES:** 11, 2 6K7 rf, 6J7 mix, 6J5 hfo, 2 6K7 if, 6C8 det/nl, 6J7 bfo, 6F8 af1/avc, 6V6 af out, 5Z3 rect **ANT IN:** MIL conn, 400 Ω, unbal **AF OUT:** 2 W. **REMARKS:** Built for US Navy, similar to NC100XA with added RF stage bolted/welded to rear of cabinet with separate variable capacitor and coil catacomb ganged to main receiver controls. Ref: NC-120. Photo is of receiver built by Wells-Gardner. RAO-5 had USN No, CWQ-46229.



Courtesy Doug Lyon

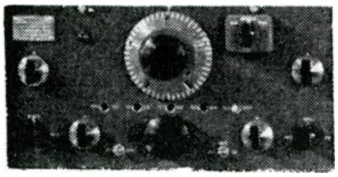
**MODEL:** RAS-1 thru -5 **YRS:** 1940-44 **BANDS:** 7, .19-30 mHz **FILTER:** None **IF:** 175 kHz **TUBES:** 9, 2 6D6 rf, 6C6 mix, 6C6 hfo, 2 6D6 if, 6F8 det/avc, 6C6 bfo, 6V6 af out **AF OUT:** 2 W. **REMARKS:** HRO-JR built for US Navy. No crystal filter, "S" meter or bandspread.

**MODEL:** RAW **YRS:** WW II **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 2 6D6 rf, 6C6 mix, 6C6 hfo, 2 6D6 if, 6B7 det/avc/af1, 6C6 bfo, 42 af out **AF OUT:** 1.5 W. **REMARKS:** Navy HRO-JR, no meter, bandspread or crystal filter.

## NATIONAL

**MODEL:** RBH **YRS:** WW II **BANDS:** 5, 0.3-1.2, 1.7-16 mHz **IF:** 1500 kHz **REMARKS:** Navy NC-100A with two RF stages and 1500 kHz IF. Reference NC-156.

**MODEL:** RBJ **YRS:** WW II **BANDS:** 9, .05-.4, .48-30 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 2 6D6 rf, 6C6 mix, 6C6 hfo, 2 6D6 if, 6B7 det/avc/af1, 6C6 bfo, 42 af out **AF OUT:** 1.5 W. **REMARKS:** Navy HRO-JR, no crystal filter, "S" meter or bandspread.

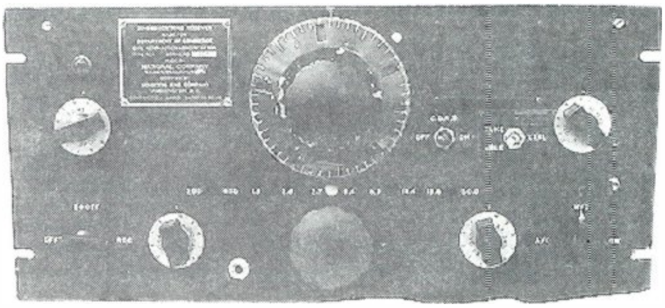


**MODEL:** RCE **YRS:** WW II **BANDS:** 5, .2-.4, 1.3-30 mHz **IF:** 457 kHz **FILTER:** None **TUBES:** 12, 6K7 rf, 6J7 1st det, 6J7 hfo, 2 6K7 if, 6C5 2nd det, 6J7 avc, 6J7 BFO, 6J7 ins control, 6C5 1st af, 6V6 af out, 80 rect **AF OUT:** 2 W. **REMARKS:** Modified NC-100 for airport control tower use.

**MODEL:** RCK **REMARKS:** NC-100.

## NATIONAL

**MODEL:** RCL **YRS:** WW II **BANDS:** 5, 0.2-0.4, 1.3-30 mHz **IF:** 455 kHz **FILTER:** Variable coupling IFT's **TUBES:** 12, 6K7 rf, 6J7 mix, 6J5 hfo, 2 6K7 if, 6C5 det, 6F8 af1/squelch, 6J7 bfo, 6J7 avc, 6J7 cons(squelch), 6V6 af out, 80 rect **ANT IN:** 2 binding posts, gnd wire **AF OUT:** 3 W, 20,000 Ω to ext spkr xfmr, 600 Ω **REMARKS:** Airway ground receiver.

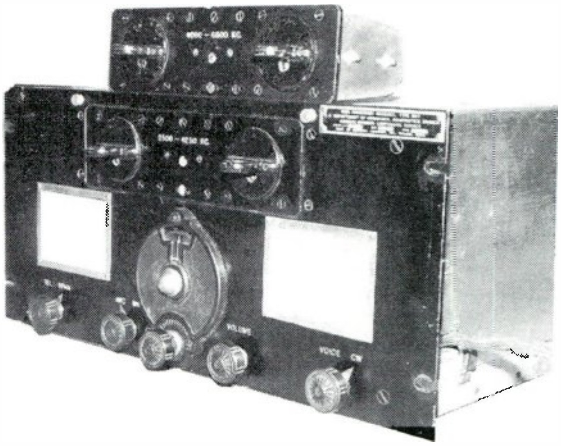


Courtesy Wayne Childress and Antique Wireless Association

**MODEL:** RCP **YRS:** 1945 **BANDS:** 5, .2-.4, 1.3-30 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 12, 6K7 rf, 6J7 1st det, 6J5 hfo, 2 6K7 if, 6C5 2nd det, 6J7 bfo, 6J7 avc amp, 6J7 avc control, 6F8 1st af/cons, 6V6 af out, 80 rect **AF OUT:** 3 W. **REMARKS:** The RCP is a modified RCK or RCL receiver. Sets were modified by Schuttig and Company, among others. Modifications were made to the following circuits: avc, hfo, cons, and 1st audio amplifier. FAA version of NC-100A.

**MODEL:** RCS **REMARKS:** USN WW II HRO.

**MODEL:** RHM **REMARKS:** Commercial designation for early AGS (q.v.).

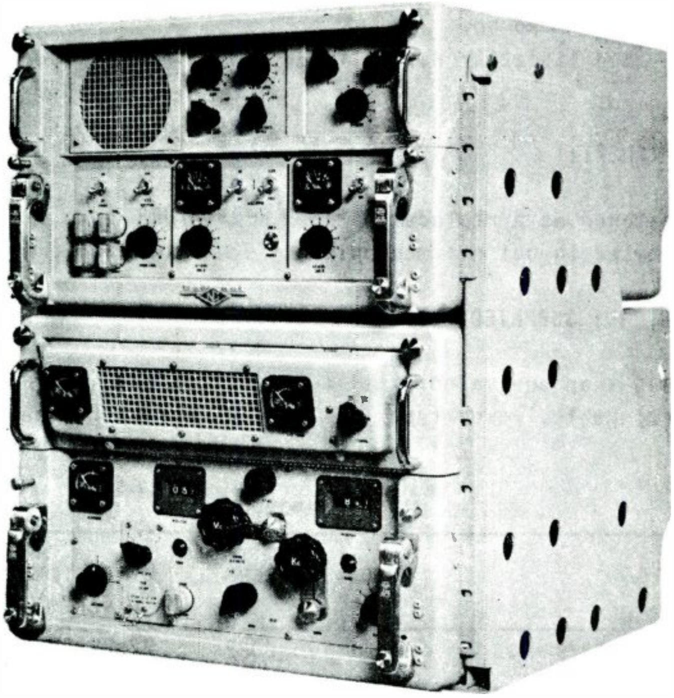


Courtesy Bill Fizette and Antique Wireless Association

## NATIONAL

**MODEL:** RHP **YRS:** 1933 **BANDS:** 2, 2.5-6.5 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 9, 78 rf, 77 mix, 36 hfo, 2 78 if, 37 det, 36 bfo, 36 avc, 89 af ou **REMARKS:** Uses plug-in coils and external power supply. Same as RHQ with minor circuit changes. Commercial designation for early AGS (q.v.).

**MODEL:** RHQ **YRS:** 1933 **BANDS:** 2, 2.5-6.5 mHz **IF:** 500 kHz **FILTER:** None **TUBES:** 9, 78 rf, 77 mix, 36 hfo, 2 78 if, 37 det, 36 bfo, 36 avc, 89 af out. **REMARKS:** Uses plug-in coils and external power supply. Commercial designation for early AGU (q.v.).

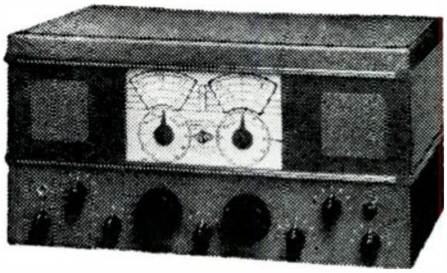


**MODEL:** WRR-2 **YRS:** 1960-65 **BANDS:** 4, 2-32 mHz **TYPE:** Triple conversion, fixed HFO **IF:** 1625-1725, 220, 80 kHz **FILTER:** Crystal lattice **TUBES:** 64 plus 24 semi diodes, 32 5654, 5 5670, 5725, 7 5749, 6 5750, 3 5751, 2 5814A, 4 6005, 3 0B2Wa, 12AT7WA, 4 1N198, 10 1N458, 2 1N457, 8 1N547 **AF OUT:** Line 60 mW, 600 Ω, phones 15 mW, 600 Ω **REMARKS:** Replaces R-390A, synthesized HFO. See FRR-59. Shipboard version of FRR-59.

## NATIONAL

**MODEL:** URR-36 **BANDS:** 9, .05-30 mHz **REMARKS:** HRO-50.

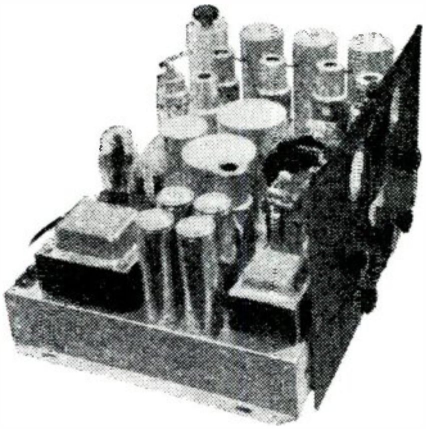
**MODEL:** URR-39 **BANDS:** .05-30 mHz **REMARKS:** No other information.



**MODEL:** Unknown **REMARKS:** Pictured in Radio Shack ads in 1946 ARRL Handbook and in March, 1946 *QST*. Assumed to be a National product.

## NORDEN

Norden Radio Laboratories, 315 Fourth Ave, New York, was the successor to the company which manufactured the famous Norden-Hauck broadcast receivers in the 1920's. H. L. Chadbourne visited their small office in late 1933 and met Alexander Norden, Jr, and was shown the "Navy" Model 34 and another small, bandswitching communictions receiver about which nothing futher is known. The Model 34 was obviously a Hammarlund Comet Pro with a couple of tuning meters added to the front panel. The significance of the use of "Navy" is not known. The model 34 was the subject of an article and advertisement in the January, 1934, *Short Wave Craft.*



## NORDEN

**MODEL:** Navy Model 34 **YRS:** 1933-34 **BANDS:** 5, .545-20 mHz **FILTER:** None **IF:** 465 kHz **TUBES:** 9, 57 mix, 58 hfo, 2 58 if, 57 det, 58 bfo, 2B7 avc amp/det, 2A5 af out 80 rect **ANT IN:** 3 screw term, A, A, G **AF OUT:** 4 W, 4000 Ω **REMARKS:** Same chassis as Comet Pro (Var 5), built by Hammarlund. Plug-in coils, two tuning meters.

## PATTERSON

Emmitt Patterson started the Patterson Electric Company in 1919. The name was changed to Patterson Radio in the mid 1920's. The company hired Ray Gudie in 1933 and he designed their first communications receiver, the All Wave 10, which became the PR-10. West Coast radio historian Floyd Paul claims that up to 50,000 PR-10's were sold, mostly to Asia. If so, the PR-10 was one of the highest volume communications receivers in history.

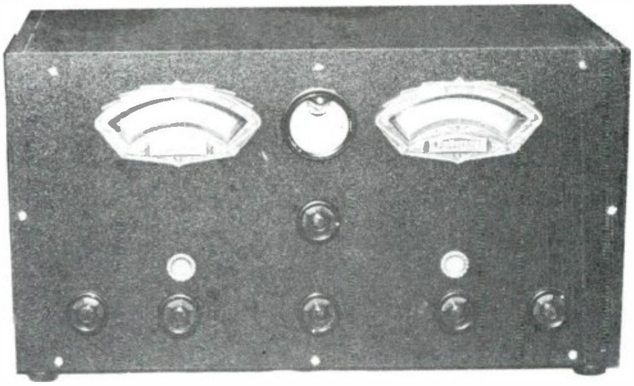
Gudie left Patterson in 1934 when they were in the throes of developing the PR-12 which, although advertised and promoted, was never produced. Karl Pierson joined the company in 1934 and supervised the design of the PR-15 and PR-16. Pierson left in 1937 to start Pierson-Delane and purchased Patterson's communications line including the PR-15.

Patterson went out of business in 1939. The company was located at 1320 So Los Angeles St, Los Angeles, from 1931 to 1938 when it moved to 1612 West Pico Blvd. All of Patterson's chassis were manufactured by Gilfillan, Inc. under their RCA license at 1815 Venice Blvd, Los Angeles.

The PR-15 was tropic proofed, at least during its Patterson days, and large numbers were sold in the Far East, Indochina and China. Quite a switch from today! PR-15's were also used at the *Los Angeles Times* monitoring station for Amelia Earhart's last flight and reportedly picked up signals after she disappeared.

## PATTERSON

**MODEL:** All Wave 10 **YRS:** 1933 **IF:** 262 kHz **REMARKS:** Essentially same as PR-10. Differentiated by "Patterson All-Wave" marked on "R" meter.



Tnx Henry Rogers and Antique Radio Classified

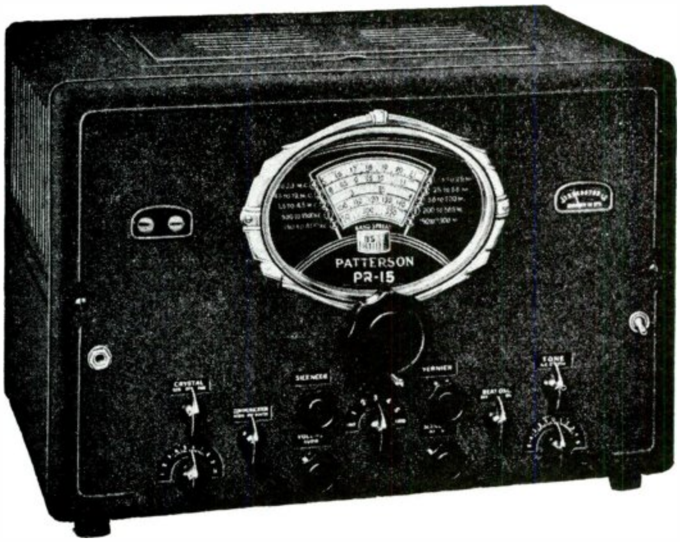
**MODEL:** PR-10 **YRS:** 1933-34 **PRICE:** $70.25 **BANDS:** 4, .54-21 mHz **FILTER:** None **IF:** 432.5 kHz **TUBES:** 10, 57 mix, 56 hfo, 3 58 if, 55 det/avc/af1, 57 bfo, 57 mtr amp, 59 af out, 5Z3 rect **ANT IN:** Unbal **AF OUT:** 3 W, 1500 Ω to ext out xfmr **REMARKS:** "R" meter, antenna trimmer. 50,000 reportedly sold, mostly in SE Asia.

**MODEL:** PR-12 (Prototype) **YRS:** 1934 **PRICE:** $83.70, $89.70 with crystal **BANDS:** 5, .55-32 mHz **IF:** 432 kHz **FILTER:** Optional crystal **TUBES:** 12, 6D6 rf, 6A7 conv, 2 6D6 if, 75 det, 75 af1, 75 af2, 6D6 bfo, 6D6 mtr amp, 2 42 p/p af out, 5Z3 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** to ext out xfmr **REMARKS:** First announced October, 1934. In November, 1934, it was announced ". . .on August 7, [1934] all models [of the PR-12] submitted by the engineering staff were deliberately scrapped. That department has been reorganized and E. R. Patterson himself is now actively in charge as chief engineer." In the June, 1935, QST, "Now in production, The new improved Patterson PR-12 (Delivery during June)." No PR-12's were ever delivered.

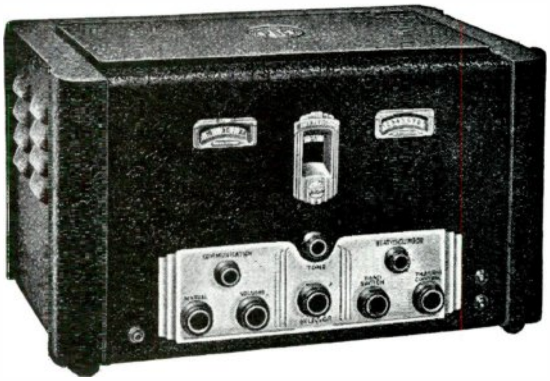
**MODEL:** PR-12 Variation **YRS:** 1934-35 **TUBES:** 12, 6D6 rf, 6A7 conv, 3 6D6 if, 85 det/avc/af1, 6F7 "S"/mod mtr, 6D6 bfo, 76 af2, 2 42 p/p af out, 5Z3 rect **REMARKS:** This circuit variation shown in article and schematic in April, 1935, *Radio.*

**MODEL:** PR-12C **PRICE:** $129.50 (list) **REMARKS:** Chassis, tubes, speaker.

**MODEL:** PR-12K **PRICE:** $169.50 (list) **REMARKS:** PR-12 in console.



**MODEL:** PR-15 **YRS:** 1937-39 **PRICE:** $109.50 **BANDS:** 5, .55-40 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 15, 2 6K7 rf, 6A8 mix, 6K6 hfo, 6K7 if, 6L7 if/nl, 6Q7 det/avc/af1, 6K7 noise amp, 6H6 noise rect, 6N7 auto threshold, 6J7 sq, 6C5 bfo, 2 6V6 af out, 5X4 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 15 W, to ext out xfmr.



**MODEL:** PR-16 **YRS:** 1935-36 **PRICE:** $89.70 **BANDS:** 5, .55-32 mHz **IF:** 458 kHz **FILTER:** None **TUBES:** 16, 2 6D6 parallel rf, 6D6 mix, 6C6 hfo, 3 6D6 if, 6F7 det/bfo, 6C6 avc, 76 meter amp, 6A6 af inv, 2 76 af driver, 2 6A3 af out, 5Z3 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** to ext out xfmr **REMARKS:** Replaced PR-12, perhaps only communications receiver to use parallel rf amplifier tubes.

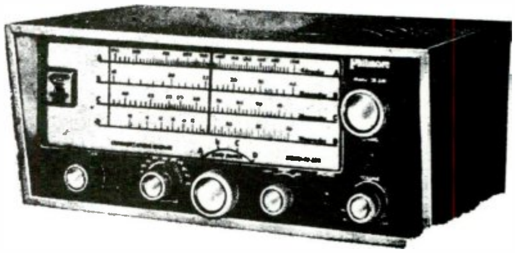
**MODEL:** PR-16 Variation **REMARKS:** Audio output stage uses push-pull 42's.

**MODEL:** PR-16C **PRICE:** $95.70 **FILTER:** Crystal **REMARKS:** PR-16 with crystal filter.

**MODEL:** PR-16CK **REMARKS:** Console models of PR-16C and PR-16.

## PHILMORE

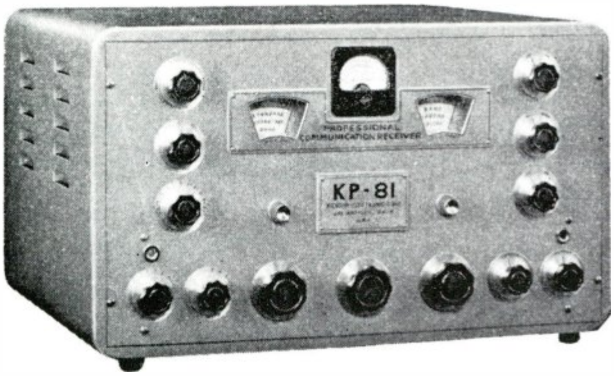
Philmore Radio Co, was a manufacturer and distributor of low-priced accessories and components.



**MODEL:** CR-5AC **YRS:** 1961 **PRICE:** $51.90 **BANDS:** 4, .55-30 mHz **FILTER:** None **TUBES:** 4 + rect **REMARKS:** Internal 4" speaker, probably imported.

## PIERSON

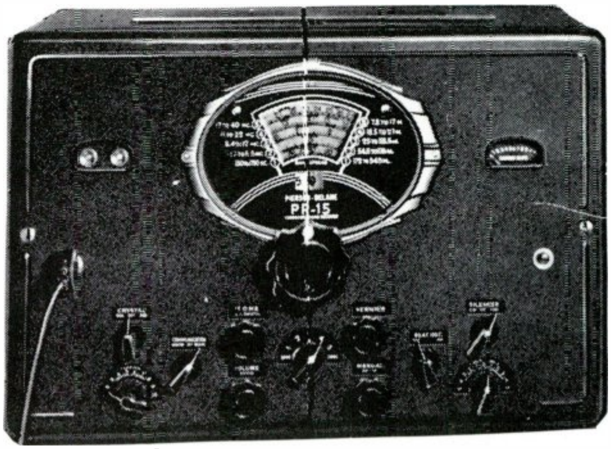
Pierson Electronic Corp, 533 E. Fifth St. Los Angeles, entered the post-war market in 1946 with a top-of-the-line communications receiver designed by Karl E. Pierson of Patterson (q.v.) fame. This was apparently their only product and they went out of business in 1948. A recent issue of *Electric Radio* said that Pierson, W6BGH, had passed away at the age of 83 in 1991.



**MODEL:** KP-81 **YRS:** 1946-47 **PRICE:** $318 **BANDS:** 5, .54-40 mHz **IF:** 465 kHz **FILTER:** Crystal + cascaded L/C **TUBES:** 20, 2 7A7 rf, 7B8 mix, 7B5 hfo, 7A7 if1, 6L7 if2, 7H7 if3, 7A4 inf imp det, 7B4 af1, 7C7 bfo, 7Y4 avc, 7A6 noise rect, 7H7 noise amp, 7A7 noise cont, 7A7 mtr amp, 7C7 sq, 7C7 calib, 2 7C5 af out, 5U4 rect **ANT IN:** 3 screw term, A, D, G, 75 Ω nom **AF OUT:** 12 W, to 10" dyn spkr on pwr chassis, phones 1,000-4,000 Ω, 18 mW **REMARKS:** "Designed by Karl E. Pierson creator of the PR series." Movable coil rack, cascaded if transformers, separate power chassis includes power supply, AF output and speaker. Less than 300 built.

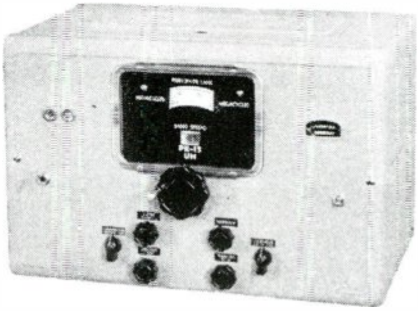
## PIERSON-DELANE

Karl E. Pierson, W6BGH, and a Mr. DeLaplane (contracted to DeLane) formed Pierson-DeLane, 2345-47 W. Washington Blvd, Los Angeles, in 1937. The company continued in business until 1943. Pierson was president and chief engineer and DeLaplane was VP and finacial officer. They purchased the communications equipment line from Patterson Radio where Pierson had designed the PR-15 and PR-16. The PR-15 was modified slightly and was Pierson-DeLane's major product until they started concentrating on two-way radio equipment in 1939. The receivers were manufactured by Gilfillin Bros. (q.v.)



Courtesy of Michael A Burke

**MODEL:** PR-15 **YRS:** 1937-39 **REMARKS:** Same as Patterson PR-15 with minor design changes. Over 2000 sold.



**MODEL:** PR-15UM **BANDS:** 28-46 mHz **REMARKS:** Special police receiver. No filter or BFO. Fixed IF band width.

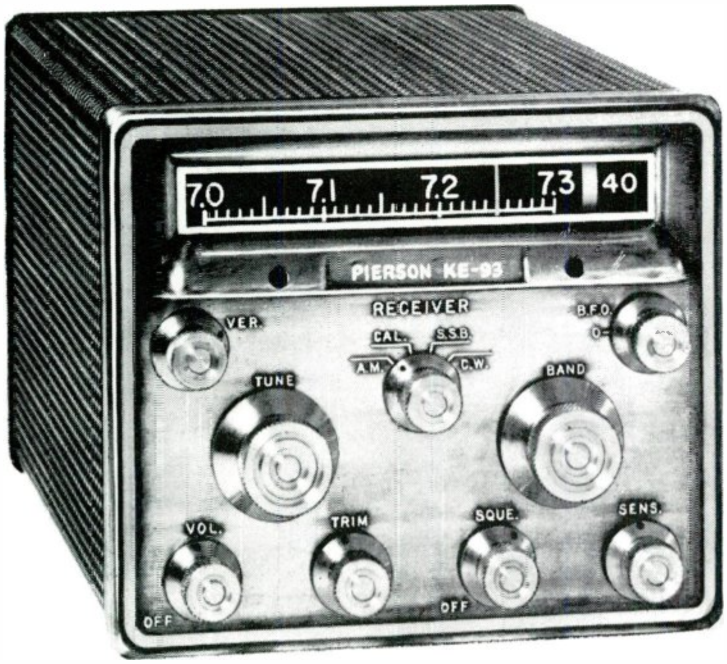
## PIERSON-HOLT

Pierson-Holt Electronics, 2308 Washington Blvd, Venice, CA, was the last venture for Karl Pierson in conjunction with Eskil Holt, W7DGT/W6NNE. The company existed from 1954-57 and they advertised their receiver as the design of Karl E. Pierson and as the successor to the KP-81.

The company was sold to Automation Electronics, Inc, 1500 W. Verdugo Ave,

## PIERSON-HOLT

Burbank, CA, in 1957. They continued to manufacture the KE-93 until 1960. Pierson died in 1991 at the age of 83, Holt in 1993 at 84.

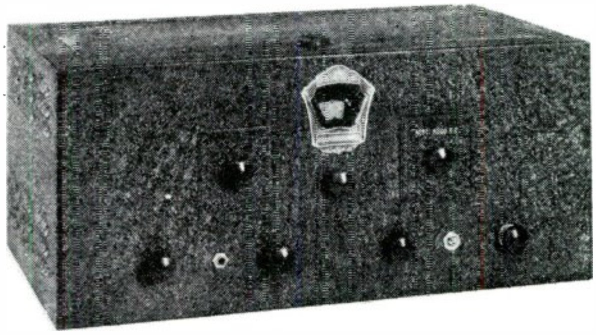


**MODEL:** KE-93 **YRS:** 1955-60 **PRICE:** $194.50 **BANDS:** 7, BC + 160-10 mtrs **TYPE:** Double conversion, variable hfo **IF:** 2200, 265 kHz **FILTER:** 265 kHz L/C **TUBES:** 13, 6BZ6 rf, 6BE6 mix1, 3CB6 hfo, 6BE6 mix2/xco, 6BA6 if1, 6BE6 if2, 6AL5 det/avc, 12AX7 af1/bfo, 6AU6 noise amp, 6AL5 noise rect/damp, 6BA8A sq, 6AQ5 af out, 7HTF3 ballast **ANT IN:** Mot jack, 50 Ω, BC band hi Z **AF OUT:** 3 W, 8 Ω **REMARKS:** Mobile type receiver, turret bandswitching, separate power supply.

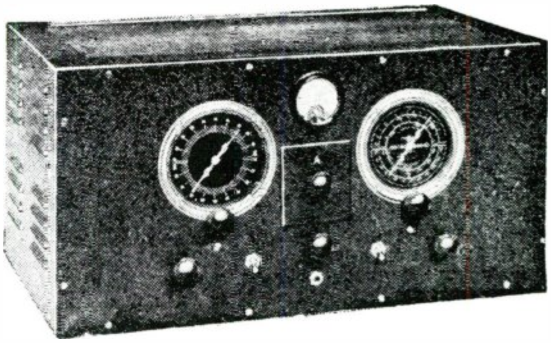
## POSTAL RADIO

Postal Radio Co, 133/135 Liberty St, New York, produced communications receivers and accessories in 1934 and 1935. S. Miller was chief engineer.

## POSTAL



**MODEL:** International **YRS:** 1933-34 **PRICE:** $41.50, $49.50 wired **BANDS:** 5, .55-21 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 9, 57 rf, 57 mix, 58 hfo, 2 58 if, 57 det, 58 bfo, 2A5 af out, 80 rect **ANT IN:** 2 binding posts, A, G **AF OUT:** 3 W, to ext out xfmr **REMARKS:** Triple gang plug-in coils can be switched for either bandspread or general coverage. Coils same design as McMurdo Silver 3A.



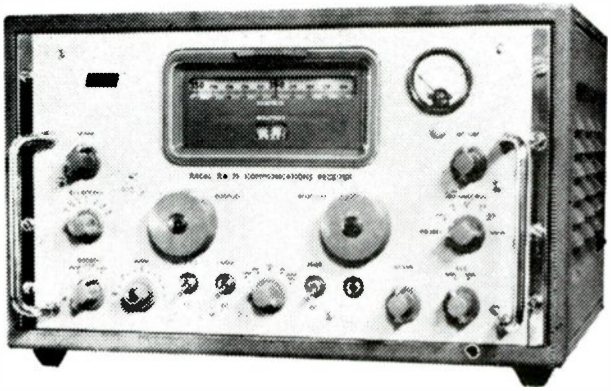
**MODEL:** '35 **YRS:** 1934-35 **BANDS:** .55-23 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 10, 58 rf, 57 mix, 56 hfo, 2 58 if, 2B7 det/avc/af1, 58 bfo, 2 2A5 af out, 80 rect **REMARKS:** Triple gang plug-in coils.

## RACAL

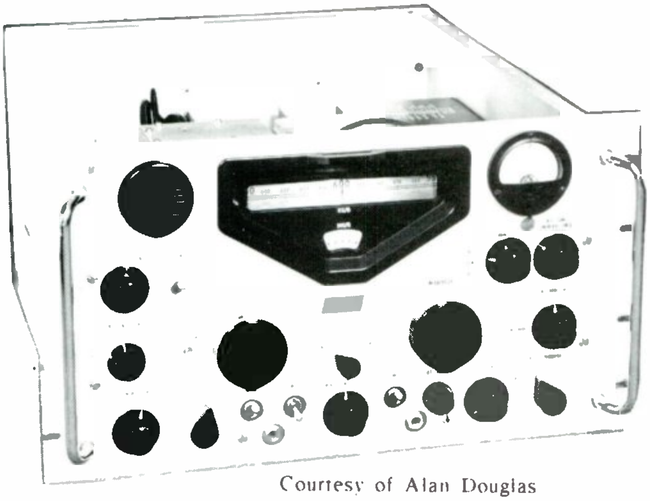
The big British manufacturer, Racal Electronics, set up Racal Communications, Inc, in Silver City, MD, in the early 1960's to assemble Americanized versions of their commercial level communications receivers. We believe they only made two vacuum tube models before going all solid state in 1967 or 1968. The RA71 was the American

## RACAL

version of the RA17 and the RA6117 corresponded to the RA117. The RA17 and the RA71 were the only commercial receivers to use the Wadley Loop system.



**MODEL:** RA71 **YRS:** 1964-65 **BANDS:** 30, 0.5-30 mHz **TYPE:** Drift cancelling Wadley Loop **IF:** 39.5-40.5, 2-3 mHz, 100 kHz **FILTER:** Crystal lattice **TUBES:** 20, 6EH7 rf, 6688 mix1, 6688 mix2, 6BE6 mix3, 6AU6 vfo, 6BA6 if1, 12AU7 notch, 6BA6 if2, 6AL5 nl, EK90 prod det/bfo, 6AL5 avc rect, 12AU7 af1, 6AK6 af out, 6AU6 xco, 6AU6 har gen, 6AS6 inj mix, 6AU6 mHz vfo, 3 6AU6 37.5 mHz inj if **ANT IN:** SO239 **REMARKS:** US version of British RA17. Over 10,000 RA17's made in England.



Courtesy of Alan Douglas

**MODEL:** RA6117 **YRS:** 1965-66 **REMARKS:** American version of the British RA117.

## RADIO CONSTRUCTORS CO

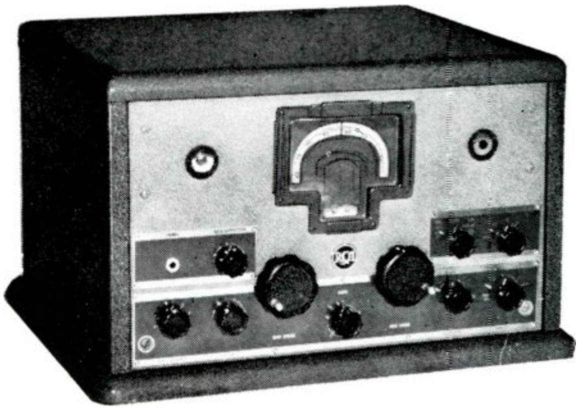
**HISTORY:** See Sargent.

## RCA

The RCA Victor Company, Inc. Amateur Radio Section, Camden, NJ, produced amateur communications receivers from 1934 to 1941. The AR-88 was to be their next entry in the amateur market but WW II came along and production was diverted to the war effort and the company never reentered the amateur field.

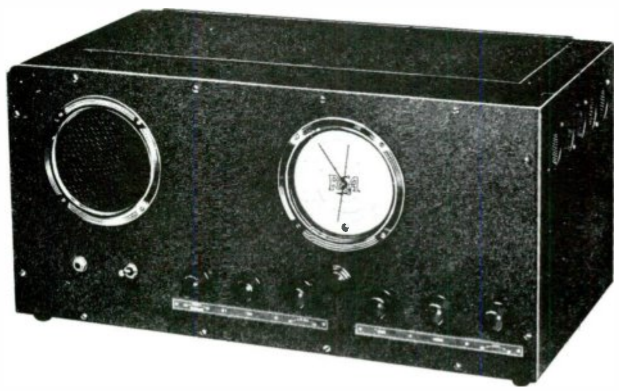
The AR-88 was sold in large quantities to England and other allies during the war and was used by RCA itself in many marine applications. Commercial versions of the AR-88, the CR-88, CR-89 and CR-91, were manufactured until the 1950's.

RCA was also a leading manufacturer of specialized military receivers from 1930's through the post-war years. Some of the better known models are the BC-312, BC-224, BC348, ARB, RBB, FR-22, FR-23. They also built specialized aircraft and marine receivers.

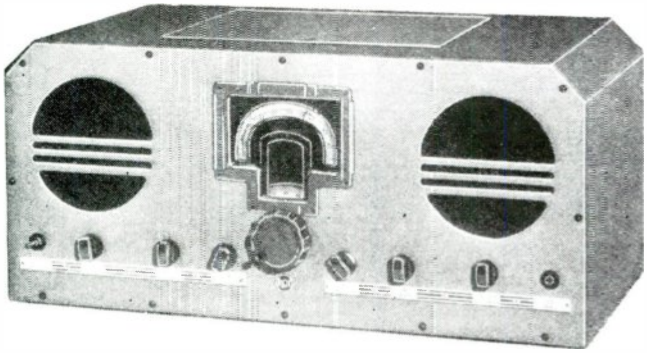


**MODEL:** ACR-111 **YRS:** 1937-38 **PRICE:** $189 **BANDS:** 5, .54-32 mHz **IF:** 460 kHz **FILTER:** Crystal **TUBES:** 16, 2 6K7 rf, 6J7 mix, 6J7 hfo, 2 6K7 if, 6H6 det, 6E5 tun eye, 6C5 af1, 6J7 noise silencer, 6C5 af2, 6R7 avc, 6J7 bfo, 2 6F6 af out, 5Z3 rect **ANT IN:** 3 term, A1, A2, G **AF OUT:** 5 W, 2 Ω.

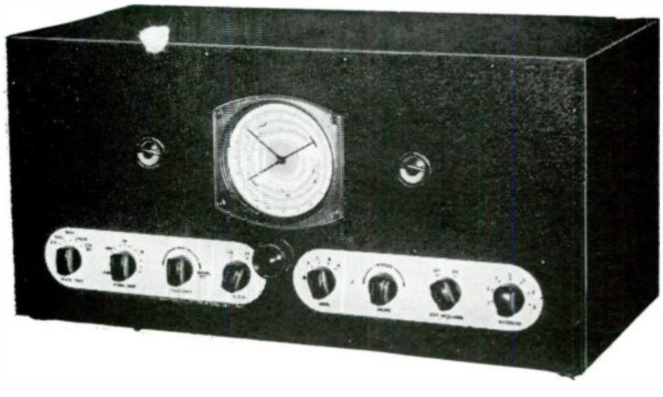
## RCA



**MODEL:** ACR-136 **YRS:** 1934-35 **PRICE:** $69 **BANDS:** 3, .54-18 mHz **IF:** 460 kHz **FILTER:** None **TUBES:** 7, 6D6 rf, 6A7 conv, 6D6 if, 6B7 det/avc/af1, 6D6 bfo, 41 af out, 80 rect **ANT IN:** 3 term, **AF OUT:** 3.4 W, 4 Ω **REMARKS:** Internal speaker.

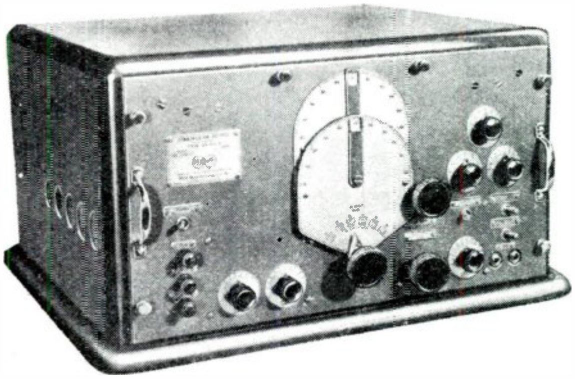


**MODEL:** ACR-155 **YRS:** 1936-38 **PRICE:** $74.50 **BANDS:** 3, .52-22 mHz **IF:** 460 kHz **FILTER:** None **TUBES:** 9, 6K7 rf, 6L7 mix, 6J7 hfo, 6K7 if, 6H6 det/avc, 6F5 af1, 6J7 bfo, 6F6 af out, 5W4 rect **ANT IN:** 2 screw term, A, G, 300 Ω **AF OUT:** 2 W, 3.2 Ω **REMARKS:** Internal 6" speaker.

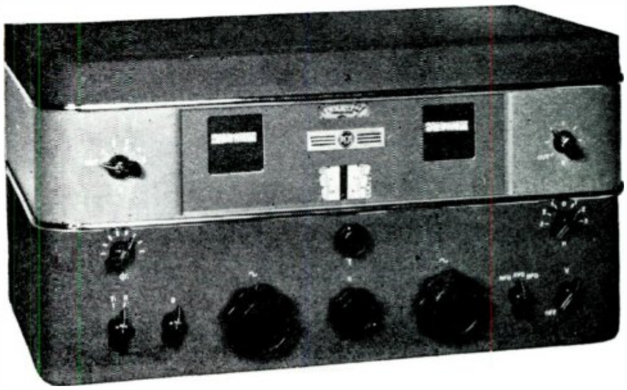


## RCA

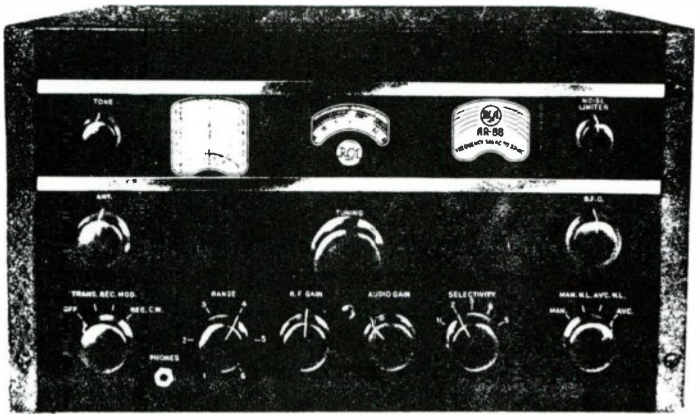
**MODEL:** ACR-175 **YRS:** 1936 **PRICE:** $119.50 **BANDS:** 4, .5-60 mHz **IF:** 460 kHz **FILTER:** Crystal **TUBES:** 11, 6K7 rf, 6L7 mix, 6J7 hfo, 2 6K7 if, 6H6 det, 6F5 af1, 6J7 bfo, 6E5 eye, 6F6 af out, 5Z4 rect **AF OUT:** 4.5 W. **REMARKS:** Tuning eye.



**MODEL:** AR-60 (R-T-S) **YRS:** 1935-36 **BANDS:** 6, 1.5-25 mHz **IF:** 750 kHz **FILTER:** Crystal **TUBES:** 11, 2 6D6 rf, 6C6 mix, 6C6 bfo, 2 6D6 if, 6B7 det/avc, 6F7 bfo/af1, 41 af out, 991 vr, 84 rect **ANT IN:** 3 binding posts, 50-500 Ω **AF OUT:** 3.4 W **REMARKS:** Weighed over 70 lbs, antenna matching circuit matches 50-500 ohms. R suffix =rack model, T = black table model, S = two tone gray table model. Less than 300 built.



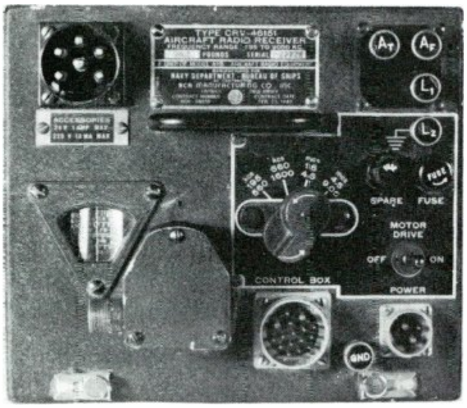
**MODEL:** AR-77 **YRS:** 1940-41 **PRICE:** $139.50 **BANDS:** 6, .54-31 mHz **FILTER:** Crystal **TUBES:** 10, 6SK7 rf, 6K8 conv, 2 6SK7 if, 6SQ7 det/avc/af1, 6SJ7 bfo, 6H6 nl, 6F6 af out, VR-105 vr, 5Y3 rect **AF OUT:** 3 W.


TONE
NOISE LIMITER
AR-88
ANT.
TUNING
B.F.O.
TRANS. REC. MOD.
RANGE
R.F. GAIN
AUDIO GAIN
SELECTIVITY
MAN. N.L. AVC. N.L.
PHONES

**MODEL:** AR-88 **YRS:** 1941-45 **BANDS:** 6, .535-32 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 14, 2 6SG7 rf, 6SA7 mix, 6J5 hfo, 3 6SG7 if, 6H6 det/avc, 6H6 nl, 6SJ7 af1, 6J5 bfo, 6K6 af out, VR-150 vr, 5Y3 rect **ANT IN:** 3 screw term, 200 Ω **AF OUT:** 2.5 W, 2.5/600 Ω **REMARKS:** Electrical design by Lester T. Fowler, mechanical design by George Blaker. No crystal phasing control. Most of production sold to England during World War II.

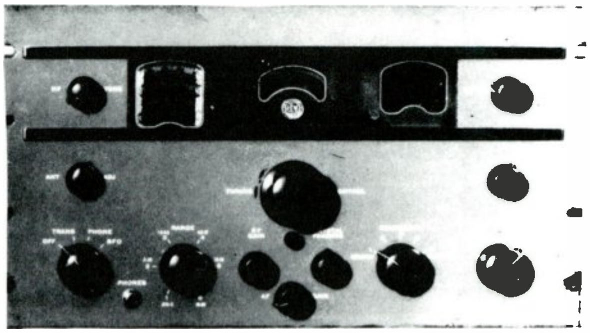
**MODEL:** AR-88D **REMARKS:** "D" = desk, i.e., with cabinet.

**MODEL:** AR-88LF **BANDS:** 6, .125-.55, 1.5-30 mHz **IF:** 735 kHz **REMARKS:** Low frequency model.


TYPE CRV-46151
AIRCRAFT RADIO RECEIVER
NAVY DEPARTMENT BUREAU OF SHIPS
ACCESSORIES
SPARE
FUSE
MOTOR DRIVE
OFF
ON
POWER
CONTROL BOX
GND

Tnx Frederick W Chesson and *Old Timers Bulletin*

**MODEL:** ARB **YRS:** WW II **BANDS:** 4, .195-9.05 mHz **IF:** 135 kHz bands 1&2 (.195-1.6 mHz), 915 kHz bands 3&4 **FILTER:** None **TUBES:** 6, 12SF7 rf, 12SA7 conv, 12SF7 if1, 12SF7 if2/det, 12SF7 bfo,avc, 12A6 af out **ANT IN:** AT, AF, unbal: L1(loop): L2 gnd **AF OUT:** 600/4000 Ω **REMARKS:** Navy aircraft receiver. 30,000 manufactured. 24 V. dynamotor power supply. Reference also CRV-46457. CRV-46151.

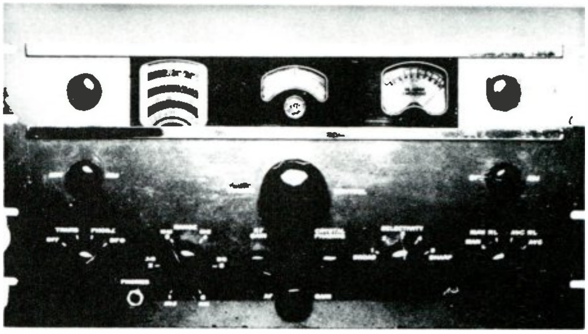


Tnx Sam Thompson, W0HDU, and *Electric Radio*

**MODEL:** CR-88 **YRS:** 1940's **REMARKS:** AR-88 with smooth, gray panel and addition of crystal phasing control. AF gain, RF gain and crystal phasing form a triangle under the main tuning knob.

**MODEL:** CR-88A **REMARKS:** CR-88 configured as a component of the DR-89A triple diversity receiver unit.

**MODEL:** CR-88B **YRS:** 1951-? **BANDS:** 6, .535-32 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 16, 2 6SG7 rf, 6SA7 mix, 6J5 hfo, 3 6SG7 if, 6H6 det/avc, 6H6 nl, 6J5 bfo, 6J5 xtal cal, 6SL7 af1/inv, 2 6K6 p/p af out, VR-150 vr, 5U4 rect **REMARKS:** Built for RCA Radiomarine Corp. Single band-in-use dial, provisions for crystal control, 500 kHz crystal calibrator, 3 position selectivity control.



**MODEL:** CR-91 **YRS:** 1944-? **BANDS:** 6, .073-.55, 1.48-30.5 **IF:** 735 kHz **TUBES:** Same as AR-88 except 6V6 af out replaces 6K6 **REMARKS:** AR-88 series, smooth gray front panel and crystal phasing control as in CR-88 (q.v.).

## RCA

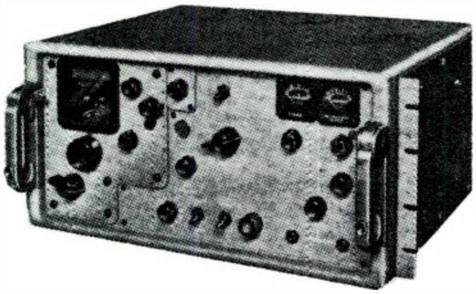
**MODEL:** CR-91A **REMARKS:** Differences not known.

**MODEL:** CRV-46151 **REMARKS:** See ARB.

**MODEL:** CRV-46246 **REMARKS:** Navy AR-88.

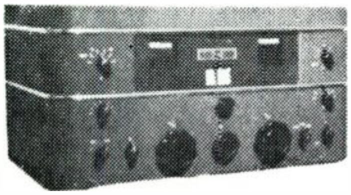
**MODEL:** CRV-46457 **REMARKS:** See ARB.

**MODEL:** DR-89 **REMARKS:** Triple diversity receiver with three AR-88, each with a diversity control in lower right of front panel. Housed in 6 ft. rack.



**MODEL:** FRR-22 **YRS:** 1949-60 **BANDS:** 5, 0.25-8 mHz **IF:** 1600 kHz (bands 4, 5 only), 200 kHz **FILTER:** Mechanical **TUBES:** 29, 5899 ant preamp, 5899 rf, 5636 mix, 5840 hfo, 5719 mix, 5636 if1, 3 5899 if, 5647 det, 5840 bfo, 5840 bfo mix, 5718 if kfol, 5647 nl, 5718 af1, 5647 silen, 5719 dc amp, 5718 af2, 2 5647 lim, 5719 af drv, 5902 af out, 5647 agc, 2 5718 calib **ANT IN:** selectable hi Z or low Z **REMARKS:** Subminiature tubes. Made for US Navy. Separate power supply. MRR-2 (mobile) and SRR-12 (shipboard) basically same receiver.

**MODEL:** FRR-23 **BANDS:** 5, 2-32 mHz **IF:** 1600, 200 kHz **REMARKS:** Same as FRR-22 except frequency range. MRR-3 and SRR-13 basically same receiver.



## RCA

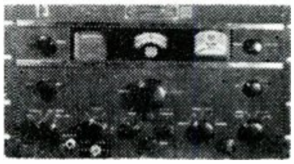
**MODEL:** GR-10 **YRS:** WW II **BANDS:** 6, .195-.41, 1.4-31 mHz **REMARKS:** AR-77 (q.v.) made for RCAF with added LF range replacing BC range.

**MODEL:** MI-17091A **REMARKS:** Same as CR-91 (q.v.).

**MODEL:** MRR-2 **REMARKS:** Mobile version of FRR-22 (q.v.)

**MODEL:** MRR-3 **REMARKS:** Mobile version of FRR-23 (q.v.).

**MODEL:** OA-58A/FRC **YRS:** 1947-? **REMARKS:** Triple diversity receiver with three R-320 receivers (SC-88).



**MODEL:** R-320 **REMARKS:** Signal Corps designation for SC-88.

**MODEL:** R-440 **REMARKS:** SRR-12

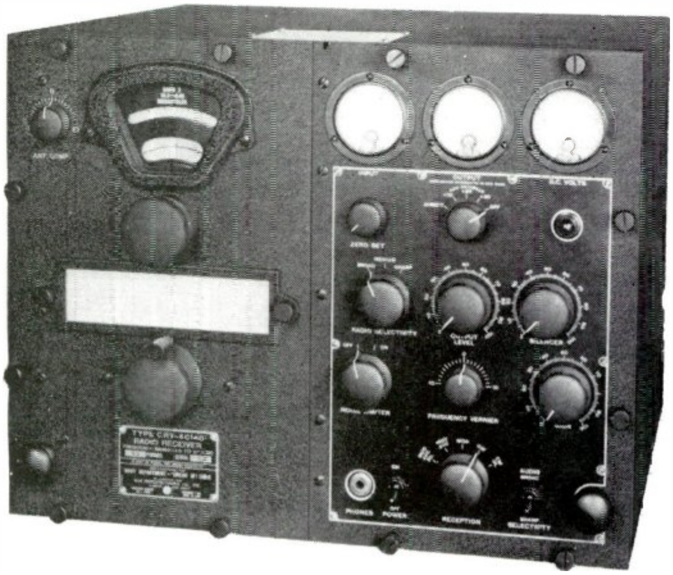
**MODEL:** R-441 **REMARKS:** SRR-13

**MODEL:** R-502 **REMARKS:** FRR-22

**MODEL:** R-503 **REMARKS:** FRR-23

**MODEL:** RBB-1 thru -6 **YRS:** WW II **BANDS:** 0.5-4 mHz **IF:** 400 kHz **FILTER:** None **TUBES:** 19 including power supply, 2 6SK7 rf, 6AB7 mix, 6AB7 hfo, 3 6SK7 if, 6AB7 bfo, 6H6 det/avc, 6H6 nl/out lim, 6SK7 af1, 6SK7 out lim amp, 6H6 sil/out lim, 6AB7 af2, 6K6 af out, 991 volt lim, 6-8B ballast, 0C3 vr, 5U4 rect **REMARKS:** USN shipboard receiver. Also manufactured by Federal Telephone.

## RCA



**MODEL:** RBC-1 thru -6 **YRS:** WW II **BANDS:** 4, 4-27 mHz **TUBES:** Same as RBB except 6AB7 rf1. **REMARKS:** Same as RBB except frequency coverage and first RF tube.

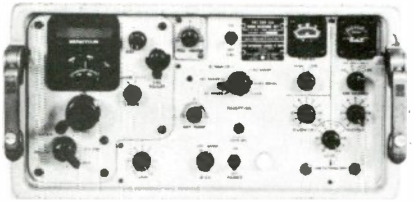
**MODEL:** RBC-3a **REMARKS:** 400 Hz version.

**MODEL:** RDM-1 **REMARKS:** Triple diversity receiver consisting of three CRV-46246B each with a diversity control in the lower right of front panel.

**MODEL:** RDQ **REMARKS:** WW II Navy AR-88.

**MODEL:** SC-88 **REMARKS:** AR-88 series with black crackle panel, crystal phasing, single band-in-use dial, some with diversity control.

**MODEL:** SRR-12 **REMARKS:** Shipboard version of FRR-22.

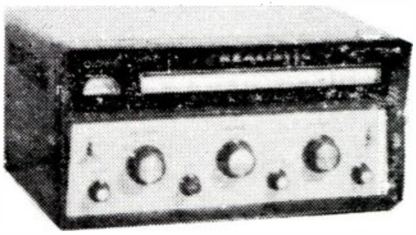


**MODEL:** SRR-13 **REMARKS:** Shipboard version of FRR-23.

**MODEL:** URR-2 **BANDS:** 14, .014-32 mHz **REMARKS:** No further info.

## REALISTIC

Radio Shack has turned out a number of solid state communications receivers under their Realistic house name. In October, 1961, they advertised a vacuum tube receiver which appears to be a Gonset G-43 with the Realistic name.



**MODEL:** GCR6 **YRS:** 1961 **PRICE:** $99,50 **BANDS:** .54-30 mHz **REMARKS:** Appears to be a Gonset G-43. Dial calibrated for 6 and 2 meters.

## RME

Radio Manufacturing Engineers of Peoria, IL, was a small company that made a big name for itself in the amateur communicaions receiver field. They had their peak recognition during the 1930's when they were one of the pioneers in the receiver market along with National, Hallicrafters and Hammarlund.

The company was started in 1931/32 by E. G. Shalkhauser, W9CI, and Russ M. Planck, W9RGH. The first receiver, the RME-9, was designed in 1932 and only about 100 were manufactured in W9CI's cellar. The receiver was redesigned to the RME-9D in 1934.

The company moved to a storefront at 313-315 Bradley Ave, in 1934 and in 1935 moved again to a factory at 306 First Ave, where they remained for many years.

Their most popular model, the RME-69, was introduced in 1935 and 6500 were manufactured through 1940. The -69 was followed in 1940 by the RME-41, -43, and -99, all of which resembled, electrically and physically, the post-war RME-45. These later receivers never attained the popularity of the -69.

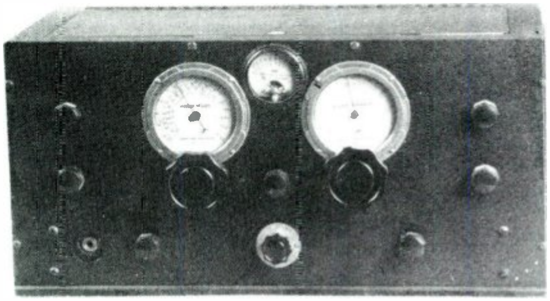
## RME

RME was a small company, employing no more than 120 people even during its peak while manufacturing instruments during World War II. It was a sharply focused company.

The company was not a big success after the war and finally merged with Electro-Voice in 1953. Shalkhauser left the company then, but Planck stayed on to supervise the design of a new series of receivers. RME remained in Peoria for awhile but was later consolidated with other Electro-Voice operations in Buchanon, Mich. During the Electro-Voice days RME produced the 4300, 4350, 6900 and 6902 receivers but they never recaptured the glory of the 1930's.

In 1962 G. C. Electronics of Rockfort, IL, purchased RME but the RME name disappeared within a year.

**MODEL:** RME-9 **YRS:** 1932-33 **PRICE:** $106.50 **BANDS:** 5, .54-22 mHz **IF:** 500 kHz **FILTER:** Crystal **TUBES:** 9, 58 rf, 57 mix, 58 hfo, 2 58 if, 2B7 det/avc/af1, 24A bfo, 2A5 af out, 80 rect **ANT IN:** 3 binding posts, A1, A2, G **AF OUT:** 600/4000 Ω **REMARKS:** Single airplane dial, "R" meter. Less than 100 built.

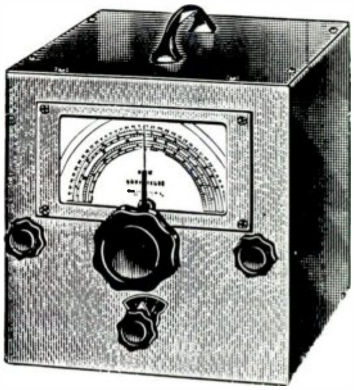


Courtesy of Fred Hammond, VE3HC

**MODEL:** RME-9D **YRS:** 1934-35 **PRICE:** $112.50 **BANDS:** 5, .54-22 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 9, 58 rf, 57 mix, 57 hfo, 2 58 if, 2B7 det/avc/af1, 24A bfo, 2A5 af out, 80 rect **ANT IN:** 3 binding posts, A1, A2, G **AF OUT:** 600/4000 Ω **REMARKS:** Twin airplane dials with "R" meter between them. Included antenna trimmer and "R" meter calibrated in "R" units and microvolts.

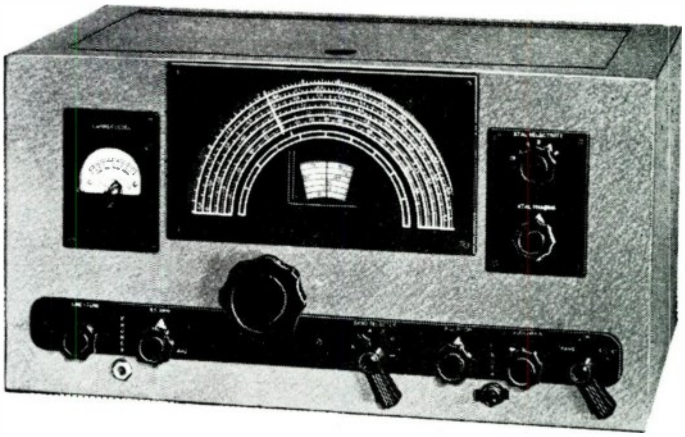
## RME

**MODEL:** RME-9D Special **BANDS:** 5, 1.45-32 mHz **REMARKS:** Otherwise same as standard -9D.



**MODEL:** ME-14 **YRS:** 1939 **BANDS:** 0.18-4.1 mHz **TUBES:** 6 **REMARKS:** Battery operated portable.

**MODEL:** RME-41 **YRS:** 1941-45 **PRICE:** $94.50 **BANDS:** 6, .54-33 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 9, 7B7 rf, 7J7 conv, 2 7B7 if, 7B6 det/bfo, 7C7 af1, 7A6 anl/avc, 7C5 af out, 80 rect **ANT IN:** 3 screw term, 150-200 Ω **AF OUT:** to 10,000/4500 spkr field coil **REMARKS:** RME-43 without crystal filter and "S" meter.

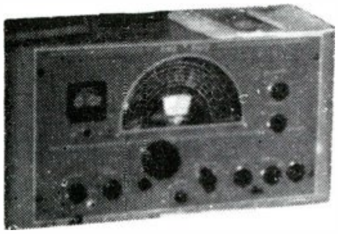


**MODEL:** RME-43 **YRS:** 1941-45 **PRICE:** $109.50 **FILTER:** Crystal **REMARKS:** Same as RME-41 with addition of crystal filter and "S" meter.

**MODEL:** RME-45 **YRS:** 1945-47 **PRICE:** $166 **BANDS:** 6, .50-33 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 9, 7B7 rf, 7J7 conv, 2 7B7 if, 7B6 det/bfo, 7C7 af1, 7A6 nl, 7C5 af out, 80 rect **ANT IN:** 3 screw term, A, A, G, 200 Ω **AF OUT:** 4 Ω, 4.5 W

**MODEL:** RME-45B **YRS:** 1947-48 **BANDS:** 6, .55-33 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 10, 7B7 rf, 7J7 conv, 2 7B7 if, 7B6 det/bfo, 7C7 af1, 7A6 nl, 7C5 af out, VR-150 vr, 80 rect **ANT IN:** 3 screw term, A, A, G, 200 Ω **AF OUT:** 4 Ω, 4.5 W **REMARKS:** Changes from RME-45: two speed tuning, calibrated band spread, VR-150, improved noise limiter with on/off switch.

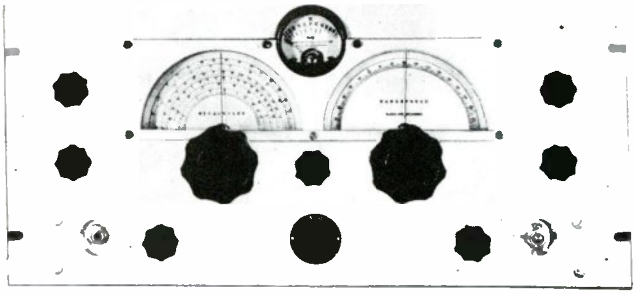
**MODEL:** RME-49 **REMARKS:** No data available.



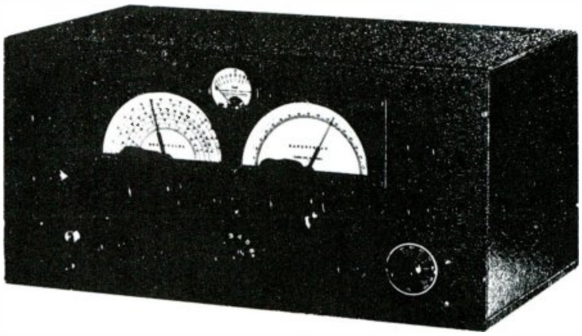
**MODEL:** RME-50 **YRS:** 1952-53 **PRICE:** $187.50 **BANDS:** 6, .54-33 mHz **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 12, 6BA6 rf, 6U8 mix/hfo, 2 6BA6 if, 6AL5 det/anl, 6AU6 af1, 6AU6 bfo, 6BA6 fm lim, 6AL5 ratio det, 6V6 af out, VR-150, 5Y3 rect **ANT IN:** 3 screw term, A, A, G, 300 Ω **AF OUT:** 3 W, 6 Ω **REMARKS:** Manual shows 6BA6 rf and if amplifiers on schematic and 6BJ6 in tube list. Earlier models may have used loctal tubes. Essentially the same circuit as RME-45B with addition of plug-in NBFM adaptor.

**MODEL:** RME-50A **REMARKS:** Differences between -50 and -50A not known.

**MODEL:** RME-55 **REMARKS:** No data available.

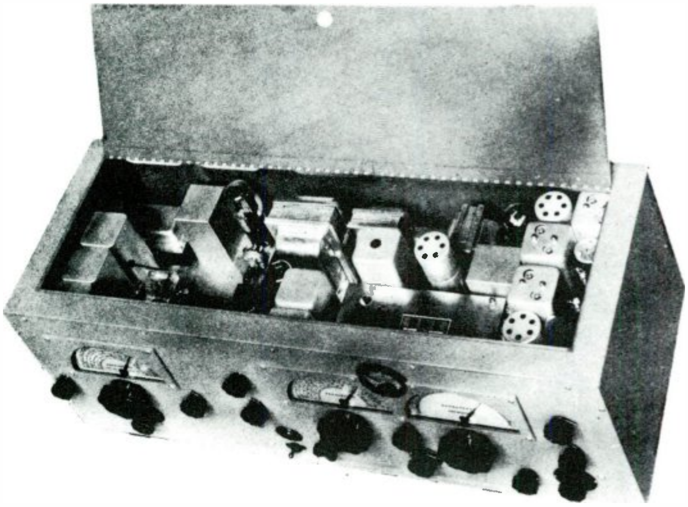


**MODEL:** RME-69 **YRS:** 1935-40 **PRICE:** $134.90 **BANDS:** 6, .55-32 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 9, 6D6 rf, 6C6 mix, 6D6 hfo, 2 6D6 if, 6B7 det/avc/af1, 6D6 bfo, 42 af out, 80 rect **ANT IN:** 3 screw term, A1, A2, G, 250-300 Ω **AF OUT:** 2.6 W, 4000/600Ω **REMARKS:** 6500 built.

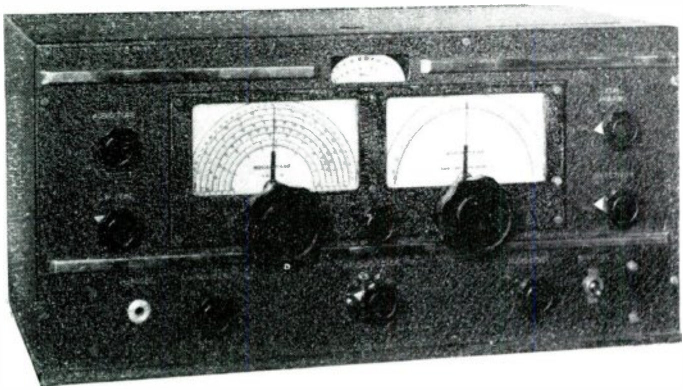


**MODEL:** RME-69/LS-1 **TUBES:** 11, replaces 2 6D6 if with 6L7 if1, 6K7 if2, 6J7 noise amp, 6H6 noise rect **REMARKS:** Includes factory installed LS-1 noise suppressor. The bfo switch is changed from lower right corner to lower left under phone jack. The silencer control is in lower right corner.

**MODEL:** RME-69/Battery **REMARKS:** Battery model operates from either A. C. or batteries. Battery switch located lower left corner under phone jack.

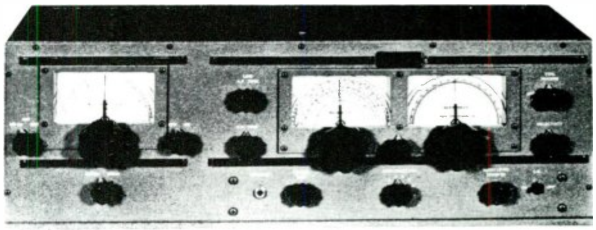


**MODEL:** RME-69/DB-20 **TUBES:** 12, adds 2 6K7 rf, 80 rect **REMARKS:** RME-69 and DB-20 preselector built into same cabinet.



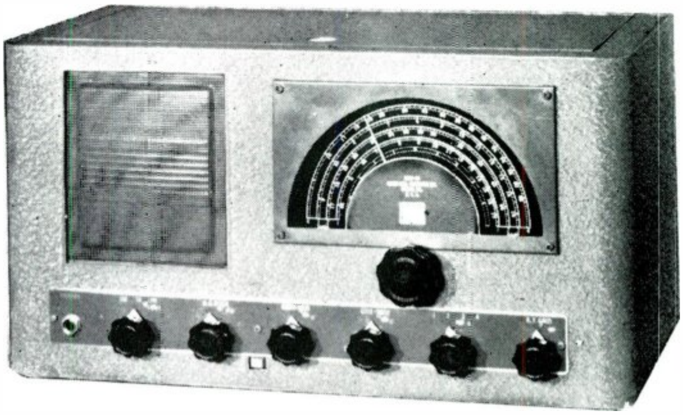
**MODEL:** RME-70 **YRS:** 1938-40 **PRICE:** $138.60 **BANDS:** 6, .55-32 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 11, 6K7 rf, 6J7 mix, 6K7 hfo, 2 6K7 if, 6H6 det/avc, 6K7 af1, 6H6 nl, 6K7 bfo, 6F6 af out, 80 rect **ANT IN:** 3 screw term, A, A, G **REMARKS:** "Resonator" control, 2 gang trimmer, Dickert noise limiter.

**MODEL:** RME-70/DB-20 **TUBES:** 14, adds 2 6K7 rf, 80 rect **REMARKS:** RME-70 and DB-20 built into same cabinet.



**MODEL:** RME-70/DM-36 **REMARKS:** RME-70 and DM-36 28-30 and 56-60 mHz converter in same cabinet.

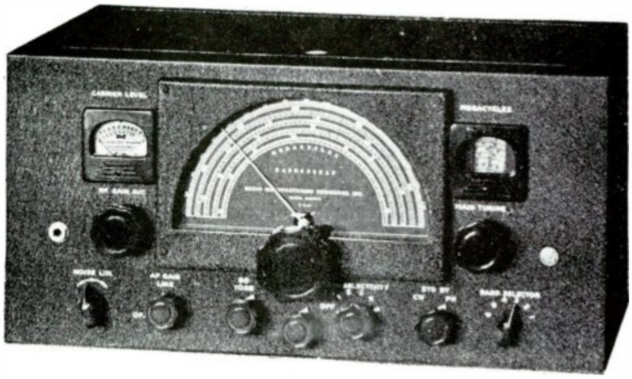
**MODEL:** RME-79 **YRS:** 1953-54 **PRICE:** $287 **BANDS:** 6, .54-30 mHz **FILTER:** Crystal **TUBES:** 12, 2 6BA6 rf, 6BE6 mix, 6C4 hfo, 2 6BA6 if, 6AU6 bfo, 6AL5 det/anl, 6AV6 af1, 6AQ5 af out, VR-150 vr, 5Y3 rect **REMARKS:** "Dial-O-Matic" tuning. Provisions for optional plug-in SSB adaptor.



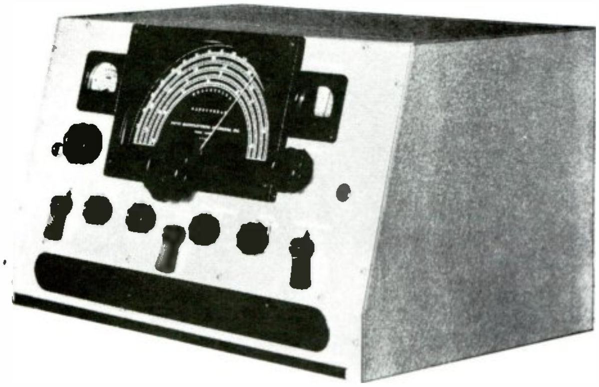
### RME

**MODEL:** RME-84 **YRS:** 1946-48 **PRICE:** $98.70 **BANDS:** 4, .54-44 mHz **IF:** 455 kHz **FILTER:** None **TUBES:** 8, 7B7 rf, 7S7 conv, 2 7B7 if, 7K7 det/avc/af1, 7K7 nl/bfo, 6G6 af out, 5Y3 rect **ANT IN:** 3 screw term, A, A, G, 300 Ω **AF OUT:** 1.1 W, 3.4 Ω **REMARKS:** Internal speaker.

**MODEL:** RME-84A **REMARKS:** Differences not known.

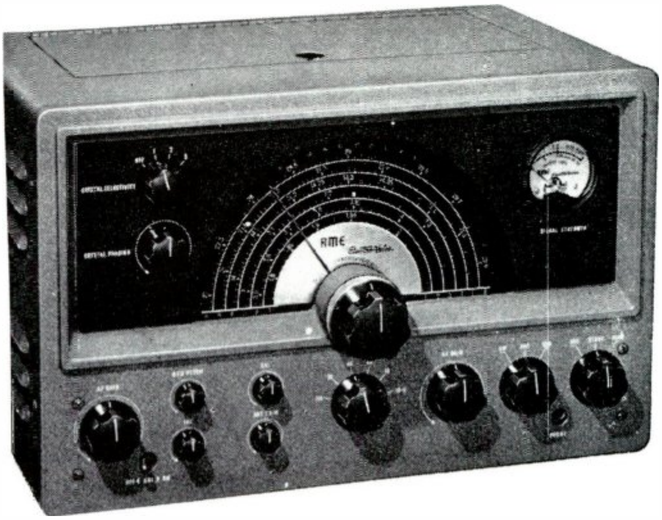


**MODEL:** RME-99 **YRS:** 1940-41 **PRICE:** $137.40 **BANDS:** 6, .54-33 mHz **IF:** 465 kHz **FILTER:** Crystal **TUBES:** 12, 7A7 rf, 7B8 mix, 7A4 hfo, 3 7A7 if, 7F7 det/af1, 7A4 bfo, 7A6 avc/anl, 7C5 af out, VR-150 vr, 80 rect **ANT IN:** 3 screw term, A, A, G, 150-200 Ω **REMARKS:** First of the RME-45 look-alike series.

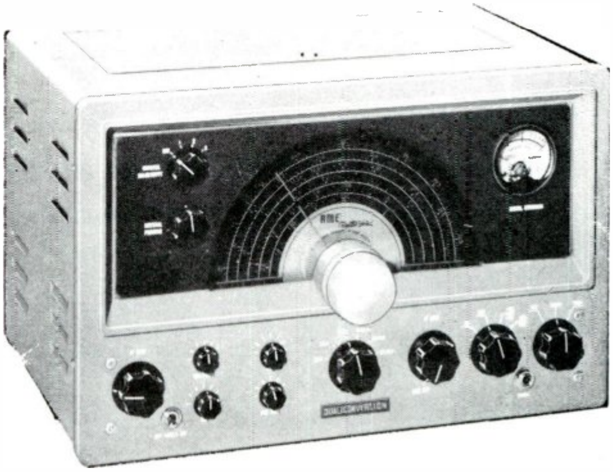


**MODEL:** RME-99 Deluxe **YRS:** 1941 **PRICE:** $139.65 **REMARKS:** Sloping panel cabinet with blank space at bottom for transmitter controls.

### RME

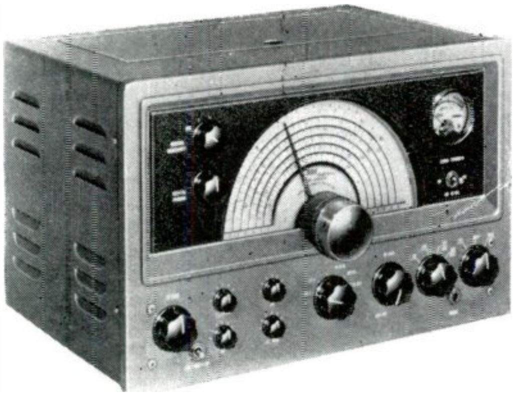


**MODEL:** RME-4300 **YRS:** 1955-57 **PRICE:** $194 **BANDS:** 6 ham bands, 160-10 mtrs **IF:** 455 kHz **FILTER:** Crystal **TUBES:** 8, 6CB6 rf, 6U8 mix/hfo, 6CB6 if1, 6U8 if2/bfo, 6T8 det/anl/af1, 6AQ5 af out, 0A2 vr, 5Y3 rect. **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 1.5 W, 4 Ω

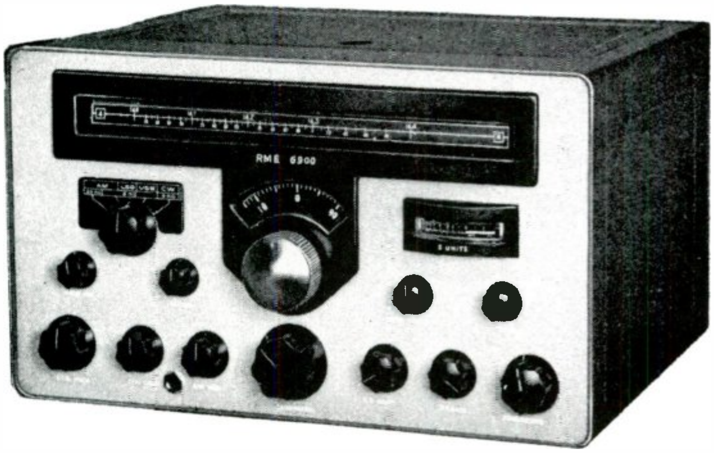


**MODEL:** RME-4350 **YRS:** 1957 **PRICE:** $229 **BANDS:** 6 ham bands, 160-10 mtrs **TYPE:** Double conversion, tunable HFO **IF:** 2195, 455 kHz **FILTER:** Crystal **TUBES:** 9, 6BZ6 rf, 6U8 mix1/hfo, 6U8 mix2/xco, 6CB6 if1, 6U8 if2/bfo, 6T8 det/anl/af1, 6AQ5 af out, 0A2 vr, 5Y3 rect **ANT IN:** 3 screw term, 50-600 Ω **AF OUT:** 1.5 W, 4 Ω **REMARKS:** Adds double conversion to 4300.

## RME

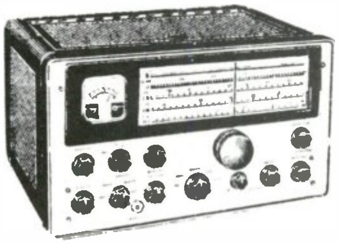


**MODEL:** RME 4350A **YRS:** 1957-59 **PRICE:** $249 **TUBES:** 10, as 4350 except adds 6CB6 calib **REMARKS:** Same as 4350 except adds crystal calibrator and product detector.



**MODEL:** RME 6900 **YRS:** 1959-62 **PRICE:** $349 **BANDS:** 6, WWV + 5 ham bands, 80-10 mtrs **TYPE:** Double conversion, tunable hfo **IF:** 2195, 57 kHz **FILTER:** 57 kHz L/C **TUBES:** 12, + 2 Si rect, 6BA6 rf, 6U8 mix1/hfo, 6U8 mix2/xco, 6C4 if1, 2 6BA6 if2/3, 6AL5 if nl, 6T8 det/avc/af1, 12AT7 prod det/bfo, 6CB6 calib, 6AQ5 af out, 0B2 vr, 2 1N1763 rect **ANT IN:** 3 screw term, S0239 **AF OUT:** 1 W, 4/500 Ω **REMARKS:** Ad says, "engineered under the supervision of Russ Planck, W9RGH" and "its extraordinary namesake, the world famous RME-69, the first bandswitching receiver ever produced." The latter statement was far from true!

## RME

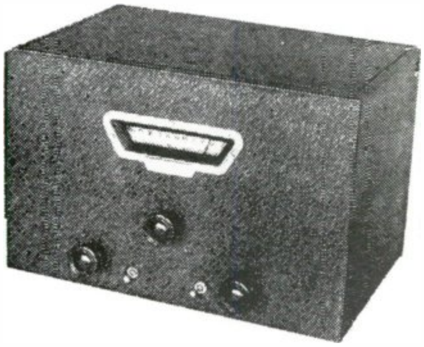


**MODEL:** RME 6902 **YRS:** 1960-61 **PRICE:** $249 **BANDS:** 5 ham bands, 80-10 mtrs **TYPE:** Double conversion, tunable HFO **FILTER:** Crystal **TUBES:** 12 **AF OUT:** 1.5 W.

## ROSS

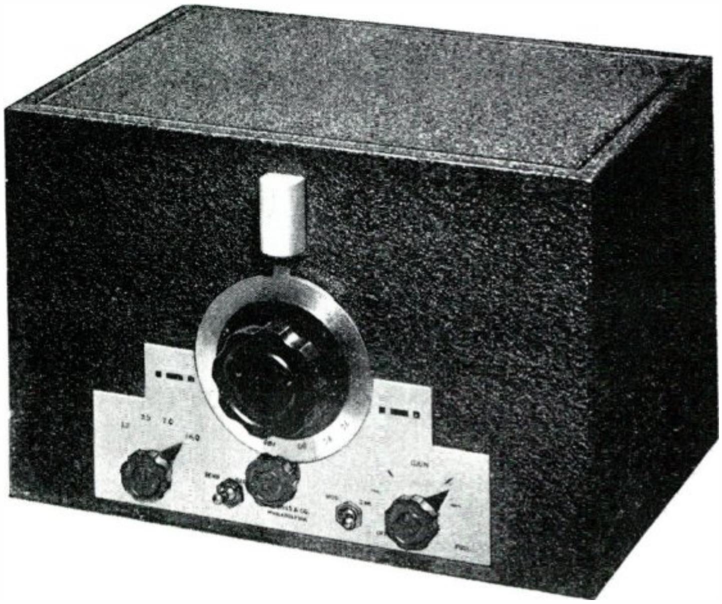
A. H. Ross & Co. produced several communicaions receivers from 1933 through 1935. They were originally located at 5839 Germantown Ave in Philadelphia and later at Keswick Ave and Waverly Road in Glenside, PA. Their first receiver, the 2B, was originally described in an article in the August, 1933 *QST*.

*QST* ad July, 1935, says "We specialize in fine custom-built receivers (16-tube crystal unit, 4-tube superhet, etc.) $25 to $150."

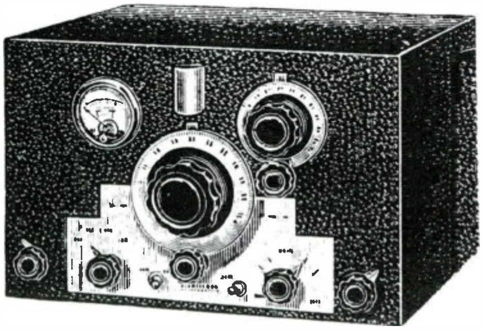


**MODEL:** 2B **YRS:** 1933 **PRICE:** $42 **BANDS:** 2* **IF:** 465 kHz **FILTER:** None **TUBES:** 6, 2A7 conv, 2 58 if, 2A7 det/bfo, 47 af out, 80 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 2.7 W to ext out xfmr **REMARKS:** *Bandswitching for any two selected ham bands, 160 to 20 mtrs.

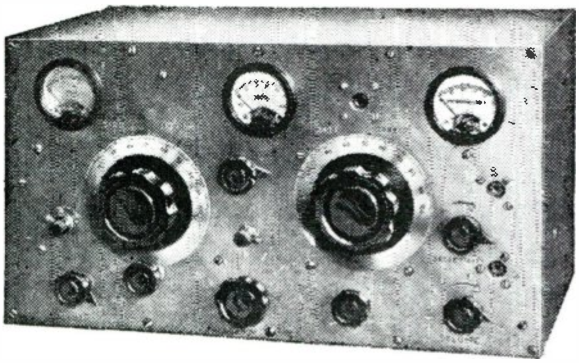
## ROSS



**MODEL:** Jupiter **YRS:** 1934 **PRICE:** $49.50 **BANDS:** 4 ham bands, 160-20 mtrs **REMARKS:** Appears same as 2B electrically with added bands and new look.



**MODEL:** 4-C Special **YRS:** 1935 **BANDS:** 4, .55-20 mHz **IF:** 456 kHz **FILTER:** None **TUBES:** 8, 6D6 rf, 6A7 conv, 2 6D6 if, 6B7 det/avc/af1, 6D6 bfo, 42 af out, 80 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 3 W to ext out xfmr.



## ROSS

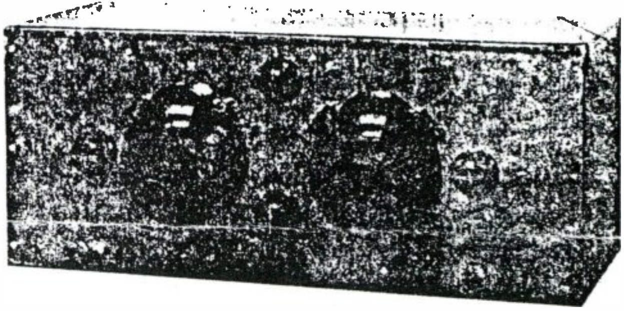
**MODEL:** Unknown **YRS:** 1935 **REMARKS:** Three meters!! Probaby one of their custom receivers.

## SARGENT

The E. M. Sargent Co. 212 Ninth St. Oakland, CA, produced communications receivers from 1933 to 1940 and an affiliated company, Radio Constructors Co, produced a couple of embryonic communications receivers as early as 1930 and 1931.

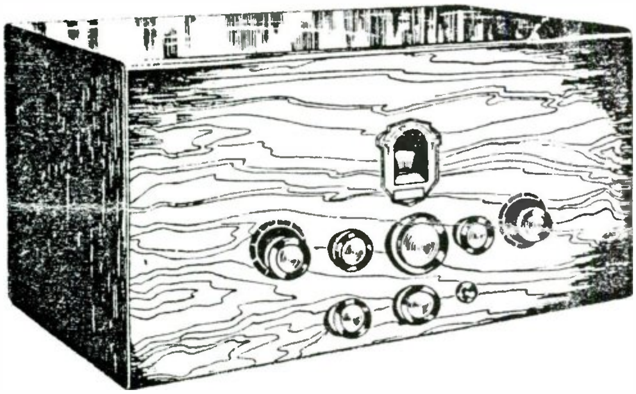
E. M. Sargent and L. G. Rayment formed Radio Service Co, at 1200 Franklin St, Oakland, CA, in 1922. They ran a radio store in the storefront and had a workshop in the basement where they developed a number of BC receivers. In 1924 Sargent formed E. M. Sargent Co, in his home at 721 McKinley, Oakland, CA. It is not clear what the company did until it began producing communications receivers in 1933. In 1927 Radio Service Co, split into Radio Constructors Co, 357 Twelfth St, and Pioneer Radio Co, which remained at 1200 Franklin St. The latter then merged into Radio Constructors Co, which moved to 3714 San Pablo in 1931 and then folded in the same year.

Sargent was an old shipboard radio operator and his company specialized in marine receivers and made a number of marine and ham regenerative receivers in addition to their superhets. In 1934 E. M. Sargent moved to 212 Ninth St, where they remained for the rest of their existence. They made their last general communications receiver in 1940. In 1948 Sargent sold his stock to long-time associate, L. C. Rayment, who, with his son, Will, formed Sargent-Rayment Co, to manufacture high-fidelity equipment. E. M. Sargent died in 1948 at the age of 56.

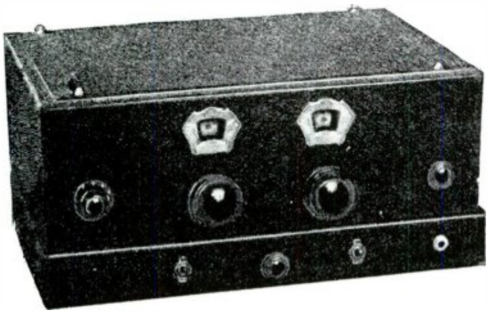


## SARGENT

**MODEL:** Long-Distance De Luxe **YRS:** 1930 **TUBES:** 11 **REMARKS:** "Static reducer," battery operated. Built by affiliate company, Radio Constructors Co.



**MODEL:** SW201 Amateur Special **YRS:** 1931 **PRICE:** $68 **BANDS:** 1.5-30 mHz **REMARKS:** Band switch, bandspread, push-pull pentode af output. Built by affiliate company, Radio Constructors. "An E. M. Sargent design." Made in AC,DC, Battery Models. "The finest receiver ever built for amateur work."

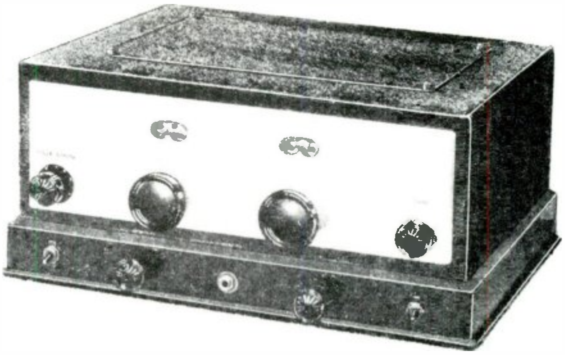


**MODEL:** 8-34 **YRS:** 1934-35 **PRICE:** $49.50 **BANDS:** 4, .55-21 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 8, 57 mix, 57 hfo, 2 58 if, 56 det, 56 bfo, 2A5 af out, 80 rect **ANT IN:** 3 wire, red, tan, black (A, A, G), bal/unbal **AF OUT:** 3 W. **REMARKS:** Had one of first antenna trimmers.

**MODEL:** 8-34 Marine **PRICE:** $57.50 **BANDS:** 5, 0.2-20 mHz **REMARKS:** Otherwise same as standard 8-34.

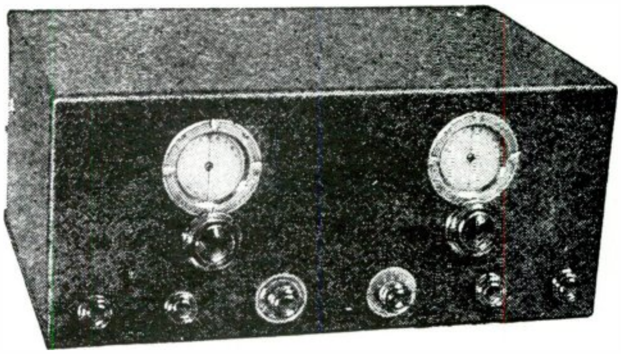
**MODEL:** 8-34 Europa Model **BANDS:** 5, 0.2-20 mHz **REMARKS:** No other information.

## SARGENT



**MODEL:** 9-33 **YRS:** 1933-34 **PRICE:** $69.50 **BANDS:** 4 **IF:** 465, 175 kHz **TYPE:** Double conversion, tunable hfo **FILTER:** 175 kHz IF **TUBES:** 9, 57 mix, 57 hfo, 2A7 conv, 58 if, 56 det, 57 bfo, 2 2A5 af out, 80 rect **ANT IN:** 3 screw term, bal/unbal **AF OUT:** 5 W **REMARKS:** First double conversion receiver? Bandspread accomplished by swivelling the stator of the tuning capacitor.

**MODEL:** All-Wave Explorer **YRS:** 1934 **PRICE:** $69.50 **BANDS:** .55-23 mHz **TUBES:** 9 **REMARKS:** Internal speaker.

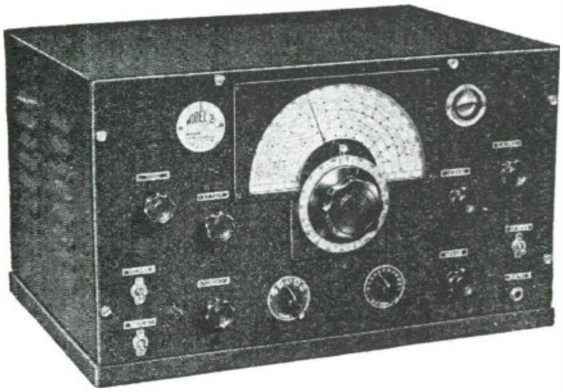


**MODEL:** 20 MA **YRS:** 1935-36 **PRICE:** $67.50 **BANDS:** 5, 0.2-21 mHz **IF:** 525 kHz **FILTER:** None **TUBES:** 9, 6D6 rf, 6C6 mix, 6C6 hfo, 2 6D6 if, 76 det, 85 avc/bfo, 42 af out, 80 rect **ANT IN:** 3 wires, red, yellow, gnd, bal/unbal **AF OUT:** 3 W. **REMARKS:** Marine model.

**MODEL:** 20SA **PRICE:** $59.50 **BANDS:** 4, .55-21 mHz **REMARKS:** Standard model - same as 20MA except price and eliminates LW band.

**MODEL:** 20XSA **PRICE:** $64.50 **BANDS:** 5, .55-30 mHz **REMARKS:** 20SA with added 10 meter band.

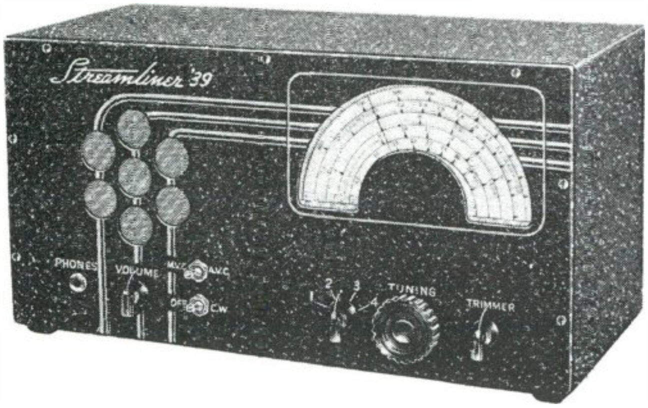
## SARGENT



**MODEL:** 21-AA **YRS:** 1936-37 **PRICE:** $139 **BANDS:** 5, .55-30 mHz **IF:** 535 kHz **FILTER:** None **TUBES:** 12, 6K7 rf, 6J7 rf regen, 6L7 mix, 6J7 hfo, 2 6K7 if, 6C5 det, 6J7 bfo, 6J7 avc, 6E5 tun eye, 6F6 af out, 5Z3 rect **ANT IN:** 3 screw term, A, A, G **REMARKS:** Regenerative RF using separate regeneration tube.

**MODEL:** 21-MA **YRS:** 1936-37 **PRICE:** $155 **BANDS:** 7, .08-30 mHz **TUBES:** 12 **REMARKS:** Regenerative RF stage.

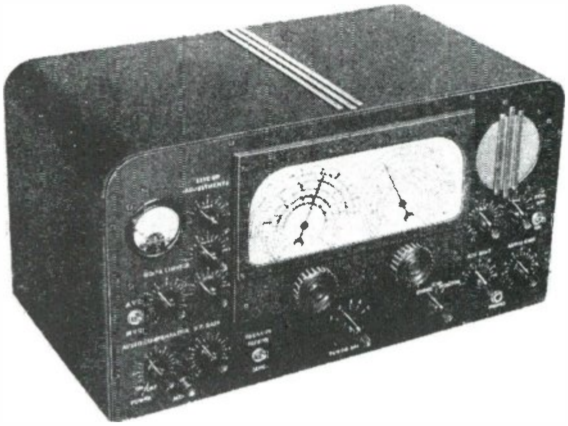
**MODEL:** 21-AA, 21-MA Battery **PRICE:** $128 and $135 respectively.



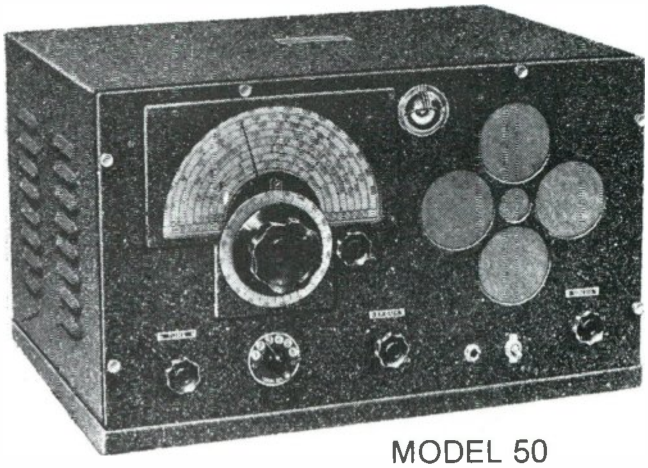
**MODEL:** Streamliner 39 **YRS:** 1938-39 **PRICE:** $33.90 **BANDS:** 4, .55-31 mHz **FILTER:** None **TUBES:** 5, 6K8 conv, 6F7 if/bfo, 75 det/avc/af1, 42 af out, 80 rect **ANT IN:** 3 screw term, bal/unbal **REMARKS:** Internal speaker. Ad says "2 if" stages?

**MODEL:** Streamliner 39 (Battery Model) **PRICE:** $38.90 **REMARKS:** No other info.

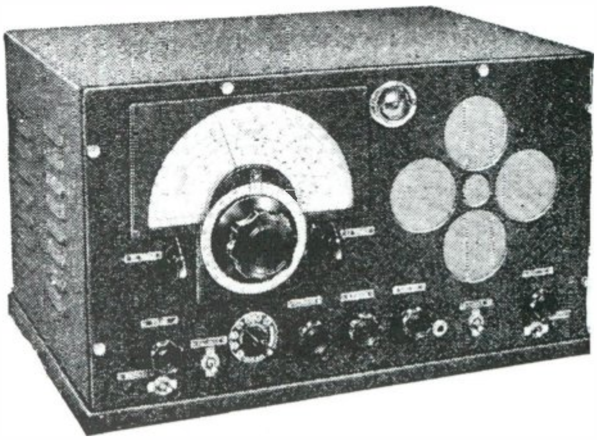
## SARGENT



**MODEL:** WAC-44 **YRS:** 1940 **PRICE:** $139 **BANDS:** 5, .54-31 mHz **IF:** 456 kHz **FILTER:** Crystal **TUBES:** 11, 2 6K7 rf, 6L7 mix, 6J7 hfo, 6K7 if1, 6F7 if2/mtr amp, 6H6 det/avc, 6F7 af1/bfo/calib, 6F6 af out, VR-150 vr, 80 rect **ANT IN:** 3 screw term, A, D, G, bal/unbal **AF OUT:** 3.5 W. **REMARKS:** Internal 4" speaker, panel trimmers for the two RF stages and mixer.



MODEL 50



MODEL 51

## SARGENT

**MODEL:** 50 **YRS:** 1938 **PRICE:** $127 **BANDS:** 6, .15-.4, .54-23 mHz **TUBES:** 8, incl. rf, conv, 2 if, det/af1, 6E5 eye, 2 43 af out, 80 rect **REMARKS:** Internal 8"speaker, AC/DC.

**MODEL:** 51-AK **YRS:** 1938-40 **PRICE:** $157 **BANDS:** 5, .54-31 mHz **IF:** 535 kHz **FILTER:** None **TUBES:** 10, 6F7 rf/regen, 6L7 mix, 6K7 hfo, 6F7 if1/if2, 6Q7 det/af1/avc, 6E5 tun eye, 6C5 bfo, 2 25L6 p/p af out, 80 rect **ANT IN:** 3 screw term, A, A, G, bal/unbal **AF OUT:** 5 W. **REMARKS:** Internal 8" speaker, AC/DC, RF and mixer panel trimmers. Triode section of 6F7 used as a feedback element to provide RF regeneration (RF Q Multiplier).

**MODEL:** 51-MK **PRICE:** $175 **BANDS:** 7, .08-31 mHz **REMARKS:** Marine version.

## SCOTT

E. H. Scott, a native New Zealander, came to the United States after World War I. He founded the Scott Transformer Co in 1924. The name of the company was changed in 1931 to Scott Radio Labs and was located at 4470 Ravenswood Ave, Chicago, IL.

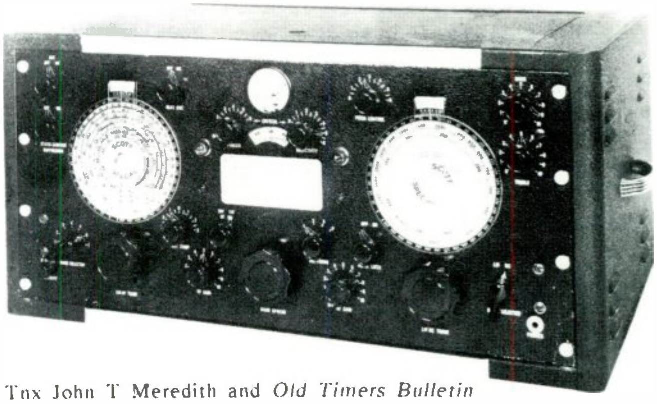
Scott Radio Labs was the best known of the manufacturers of custom, high-end broadcast receivers who flourished during the 1930's. Scott peaked in popularity in 1937 with the introduction of the massive, chrome plated 30 tube Philharmonic model. It was modestly proclaimed in full-page ads as "World's Most Powerful Radio."

Just prior to World War II Scott produced a limited run of a special 26 tube communications receiver. During the war he produced specially shielded, low radiation receivers for shipboard use for both communications and entertainment.

Scott sold most of his interest in the company in 1944 and resigned in 1945 after finding himself demoted from president to sales manager. He died in his retirement home in Victoria, BC, Canada.

## SCOTT

Meanwhile, the company became unprofitable by 1947 after entering the TV business. It was sold in 1950 to John S. Meck and had a brief revival of profitability in 1951. but by 1956 was bankrupt. The Scott Radio Labs name was exploited by a couple of companies until 1961 when it died forever as the result of a suit by H. H. Scott, Inc.

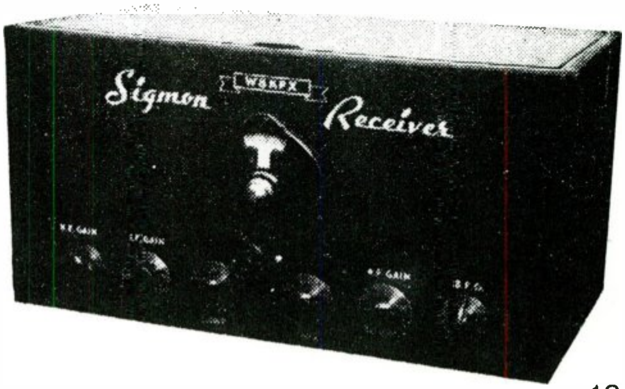


Tnx John T Meredith and *Old Timers Bulletin*

**MODEL:** Special Communications Receiver **YRS:** 1940-41 **PRICE:** $650 **BANDS:** 9, .14-64 mHz **FILTER:** Crystal **TUBES:** 26, 2 6U7 rf, 6L7 mix, 6J5 hfo (BC & LW tuner 2 6U7 rf, 6L7 mix, 6J5 hfo), 3 6K7 if, 6B8 avc amp/det, 6B8 det/bfo, 6K7 af1, 6J5 ph inv, 2 6J5 af drive, 6B8 & 6J7 static & scratch sup, 6J5 mtr amp, 6H6 nl, 2 6L6 af out VR-150 vr, 2 5U4 rect **ANT IN:** Doublet, 5 mtr, 10 mtr terms **AF OUT:** 25-40 W **REMARKS:** Separate tuners for BC/LW and SW..

## SIGMON

Sigmon Radio Supply Co, 104 Washington St, East, Charleston, W. Va, briefly entered the communications receiver market in 1940. They offered a receiver designed by Harry Hooten, W8KPX, a popular radio writer of the day.



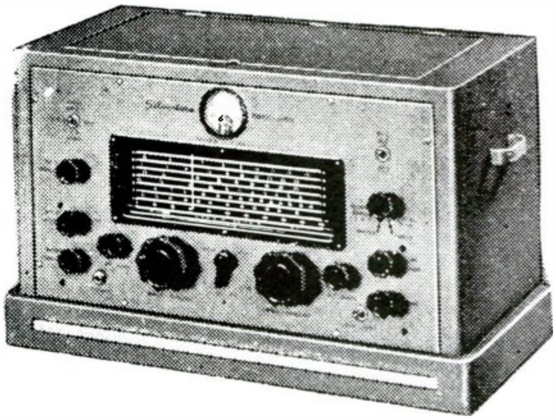
## SIGMON

**MODEL:** W8KPX Receiver **YRS:** 1940 **BANDS:** 3 ham bands, 20-5 mtrs **IF:** 1600 kHz **FILTER:** None **TUBES:** 10, 1232 rf, 7J7 mix, 7B7 hfo, 2 7A7 if, 6H6 det/avc/nl, 6C5 af1, 7B7 bfo, 7C5 af out, 5Y4 rect **REMARKS:** Kit. Plug-in coils.

## SILVERTONE

The giant mail-order house, Sears, Roebuck & Co, offered a few house brand communications receivers during the 1930's.

**MODEL:** Silvertone Super-Eight **YRS:** 1936 **PRICE:** $49.95 **BANDS:** 3, .54-18 mHz **TUBES:** 8 **REMARKS:** Internal 8" speaker.



**MODEL:** Silvertone Precision **YRS:** 1939 **PRICE:** $84.50, $94.50 w/xtal **BANDS:** 6, .54-65 mHz **FILTER:** Crystal **TUBES:** 12 **REMARKS:** Appears to be a repackaged Howard 450A.

## SONAR

Sonar Radio Corp, 58 Mytle Ave, (later 3050 West 21st St,), Brooklyn, NY, manufactured mobile-type receivers in 1952-53.

SONAR
ANL
BFO
A B C
VOLUME
BANDS
TUNING

**MODEL:** MR-3 **YRS:** 1952-53 **PRICE:** $89.95 **BANDS:** 3 ham bands, 10-11, 20, 75 mtrs **IF:** 500 kHz **FILTER:** None **TUBES:** 8, 12AT7 rf/bfo, 12AT7 conv, 2 6BA6(6CB6) if, 6AL5 det/nl, 6AT6 af1, 6AQ5 af out, 0B2 vr **AF OUT:** 4.5 W. **REMARKS:** Mobile-type, separate power supply.

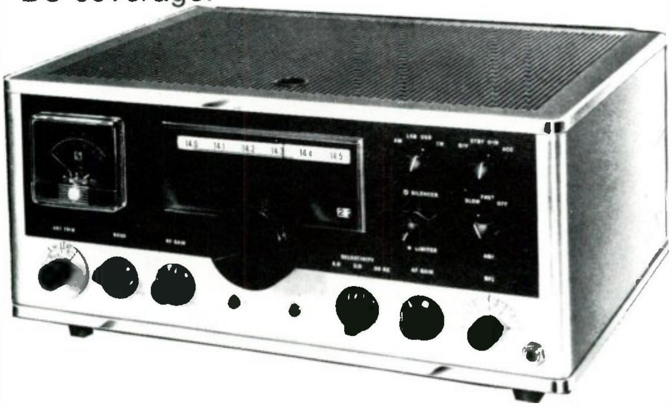
**MODEL:** MR-4 **YRS:** 1952-53 **PRICE:** $89.95 **BANDS:** 3 ham bands, 20, 40, 75/80 mtrs **REMARKS:** Same as MR-3 except freq.

## SQUIRES-SANDERS

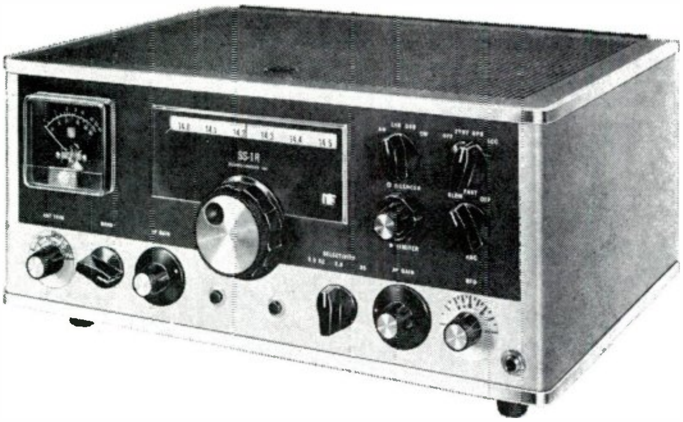
Squires-Sanders, 475 Watchung Ave, Watchung, NJ, manufactured a high dynamic range receiver designed by William Squires, using a 7360 balanced mixer, a technique described by him in a popular *QST* article, "A new Approach to Receiver Front-End Design."

INTERNATIONAL BROADCAST

**MODEL:** SS-1BS **YRS:** 1967 **PRICE:** $1200 **REMARKS:** SS-1R with shortwave BC coverage.



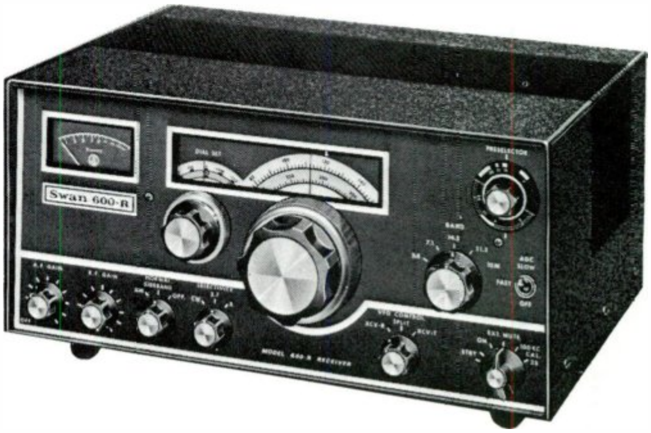
**MODEL:** SS-1R **YRS:** 1963-66 **PRICE:** $895 **BANDS:** 10 + 2 fix tune WWV, 80-10 mtrs **TYPE:** Double conversion, fixed hfo **IF:** 5000-5500, 1000 kHz **FILTER:** Crystal lattice **TUBES:** 12 + 10 semi diodes, 7360 mix1, 6BH6 xco, 7360 mix2, 6BK7 vfo/k fol, 2 6BA6 if, 6AX8 if3/af1, 6AL5 nl, 6AL5 agc, 6BE6 prod det, 6AU6 bfo, 6AS5 af out, 1N34A det, 2 1N34A vfo shift, 1N34A agc clamp/delay, 3 1N34A bfo sw, 3 SD-4 rect **ANT IN:** BNC, 52 Ω **AF OUT:** 2 W, 4/500 Ω **REMARKS:** Includes manual and pushbutton motor tuning.



**MODEL:** SS-1R/701 **YRS:** 1966-67 **REMARKS:** Changes from SS-1R: 6BY6 prod det, 6AV6 if k fol, crystal bfo, 3-6dB better sensitivity, improved reliability, better dial drum and display system.

## SWAN

Swan Electronics, 305 Airport Road, oceanside, CA, was founded in 1960 by Herb Johnson (W8QKI, W6QKI, W7GRA) in Benson, AZ. They introduced their first product, a single band SSB transceiver, in May, 1961. The transceiver sold for $275 at a time when the Collins KWM-2 went for $1150. Business boomed and they moved to a new plant in Oceanside in June, 1962. During their later days they offered a separate receiver/transmitter package.



**MODEL:** 600-R **YRS:** 1971-73 **PRICE:** $395 **BANDS:** 5 ham bands, 80-10 mtrs **IF:** 5500 kHz **FILTER:** Crystal lattice **TUBES:** 7 + 8 transistors + 12 semi diodes, 6BZ6 rf, 6BZ6 mix, 2N706 hfo, 2N706 hfo buff, 2 2N706 isol amp, 2 12BA6 if, 2N706 bfo, 12AX7 prod det/af1, 12AV6 avc amp/rect, 6AQ5 af out, 4 MPS3693 calib **ANT IN:** Phono jack, 52 Ω **AF OUT:** 3 W, 4 Ω.

**MODEL:** 600-R Custom **PRICE:** $545.95 **TUBES:** 9 + 8 transistors + 13 semi diodes, same as 600-R except adds 2 12BA6 noise amp, 1 noise rect diode, 1 IC af filter. **REMARKS:** Same as 600-R with addition of IC audio peak/notch filter and IF noise blanker.

**MODEL:** 600-R Custom/SS-16B **REMARKS:** Same as 600-R Custom with addition of special 16 pole filter.

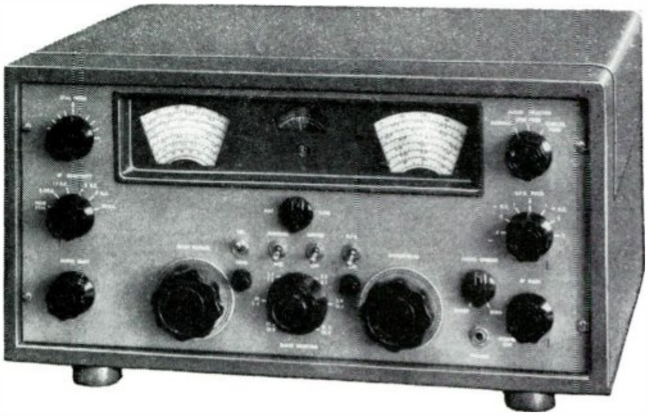
## TMC

Technical Material Corp, 700 Fenimore Road, Mamaroneck, NY, founded by Ray H. DePasquale, was a prominent manufacturer of military communications equipment during the 1950's and -60's. TMC is still in business, now run by Neil De Pasquale, son of the founder.

### TMC

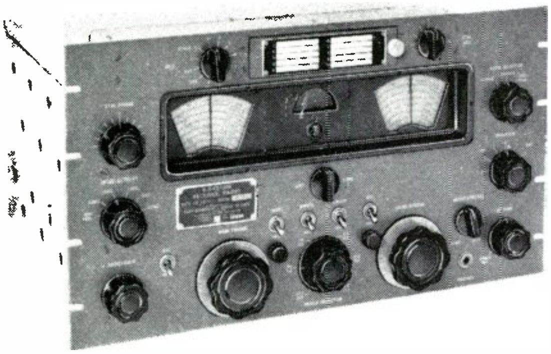
**MODEL:** DDR-3 **REMARKS:** Diversity system using GPR-90 receivers.

**MODEL:** GPR-D **REMARKS:** GPR-90 for diversity applications. Provisions for external control of HFO, BFO, IFO.



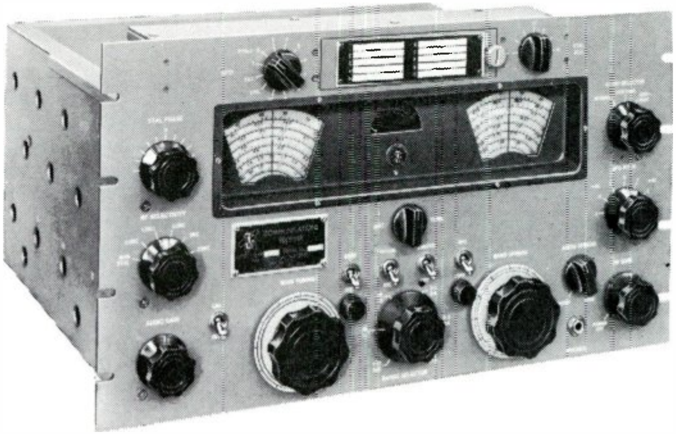
**MODEL:** GPR-90 **YRS:** 1955-56 **PRICE:** $395 **BANDS:** 6, .54-31 mHz **TYPE:** Double conversion, tunable hfo **IF:** 3955, 455 kHz **FILTER:** Crystal **TUBES:** 15, 6AB4 rf1, 6CB6 rf2, 6AU6 mix, 6AG5 hfo, 6BE6 mix2/xco, 6BA6 if buf, 3 6BA6 if, 6AL5 det/nl, 6AG5 bfo, 12AX7 avc/af1, 6V6 af out, 0A2 vr, 5U4 rect **ANT IN:** screw term, 75 Ω unbal, 300 Ω bal **AF OUT:** 2 W, 4/8/16/600 Ω **REMARKS:** Military R-825/URR.

**MODEL:** GPR-90 (Variation) **YRS:** 1956-62 **PRICE:** $495 **TUBES:** 16, adds 6AU6 calib to original GPR-90 **REMARKS:** Original GPR-90 with addition of crystal calibrator. Calibrator switch located to left of range selector.

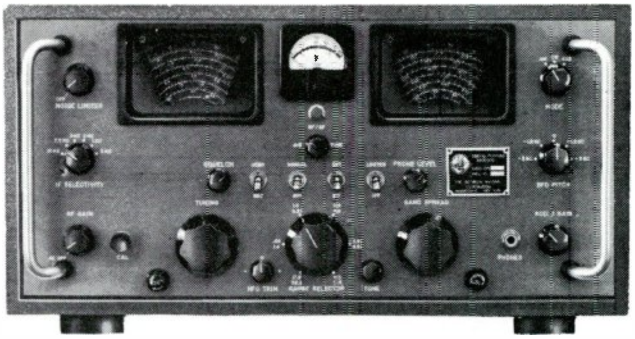


**MODEL:** GPR-90RX **REMARKS:** GPR-90 with addition of ten crystal controlled frequencies and a rear HFO/synthesizer input. Military R-840URR.

### TMC



**MODEL:** GPR-91RXD **REMARKS:** GPR-90RX with 15 kHz bandpass for four channel independent sideband reception.



**MODEL:** GPR-92 **YRS:** 1963-64 **PRICE:** $920 **BANDS:** 6, .54-32 mHz **TYPE:** Double conversion, tunable HFO **IF:** 3955 kHz bands 4-6, 455 kHz **FILTER:** Crystal **TUBES:** 18 + 5 semi diodes, 6DC6 rf1, 6BA6 rf2, 6AH6 iso amp, 6BA7 mix1, 6AH6 hfo, 6AU6 hfo, 6U8 mix2/xco, 2 6BA6 if, 6AL5 nl, 6CB6 calib, 6AZ8 if/sq, 6U8 avc amp/det, 12AT7 prod det/bfo, 6AB4 vfo amp, 12AT7 af1/af driver, 6AQ5 af out, 0B2 vr, 2 1N1084 rect, 2 1N34 rect, 1N463 rect **REMARKS:** Features 6 dB noise figure. Only 115 built.

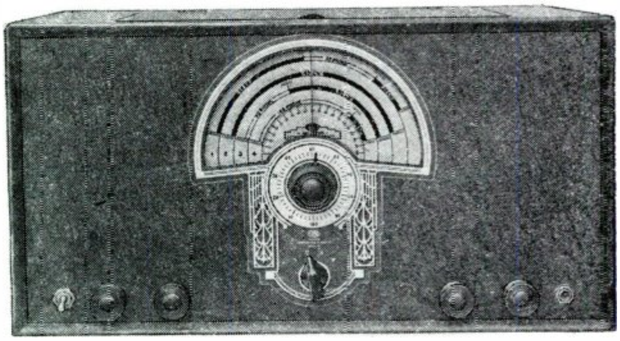
**MODEL:** GPR-92S **REMARKS:** Rack mounted model.

**MODEL:** R-825/URR **REMARKS:** See GPR-90.

**MODEL:** R-840/URR **REMARKS:** See GPR-90RX.

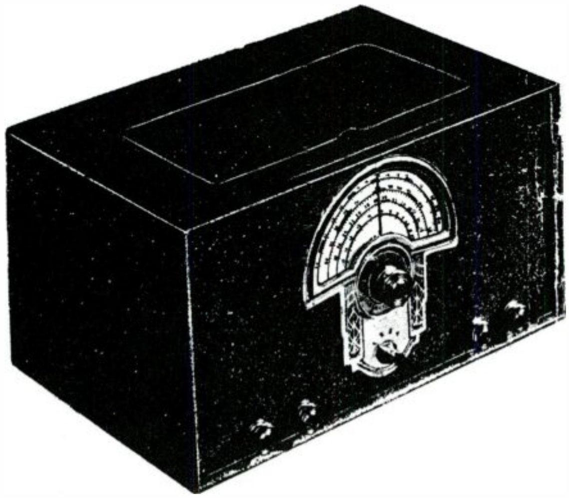
## TOBE

The Tobe Deutschmann Corp, Canton, MA, offered a line of kit receivers during the mid-1930's. The receivers were designed by Glen Browning of Browning-Drake fame. The kits used the pre-assembled Tobe Tuner. Founder Tobe Deutschmann died in 1991 at the age of 94.



**MODEL:** H (Standard) **YRS:** 1935-36 **PRICE:** $41.40 **BANDS:** 4 ham bands, 160-20 mtrs **IF:** 456 kHz **FILTER:** Regenerative IF **TUBES:** 7, 6D6 rf, 6A7 conv, 6D6 if, 75 det/avc/af1, 76 bfo, 42 af out, 80 rect **AF OUT:** 3 W. **REMARKS:** Kit.Triple tuned IF transformers. First ham band only receiver? Bandswitched.

**MODEL:** H (Special) **PRICE:** $47.40 **REMARKS:** Kit. Same as standard model except uses air trimmers vs mica trimmers in the tuner.



**MODEL:** Browning 35 (2.5 V. version) **YRS:** 1935 **BANDS:** 4, .55-22.6 mHz **IF:** 465 kHz **FILTER:** None **TUBES:** 7, 58 rf, 2A7 conv, 58 if, 2A6 det/af1, 56 bfo, 2A5 af out, 80 rect **ANT IN:** 3 screw term **AF OUT:** to ext out xfmr. **REMARKS:** Kit. Triple tuned IF transformers.

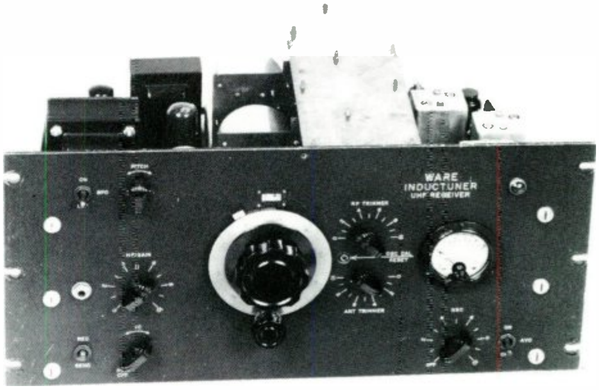
## TOBE

**MODEL:** Browning 35 (6.3 V. version) **YRS:** 1935 **TUBES:** 7, 6D6 rf, 6A7 conv, 6D6 if, 75 det/af1, 76 bfo, 42 af out, 80 rect.

**MODEL:** Browning 35 (Metal tube version) **YRS:** 1936 **IF:** 456 kHz **TUBES:** 8, 6K7 rf, 6A8 conv, 6K7 if, 6H6 det, 6F5 af1, 6C5 bfo, 6F6 af out, 80 rect.

## WARE

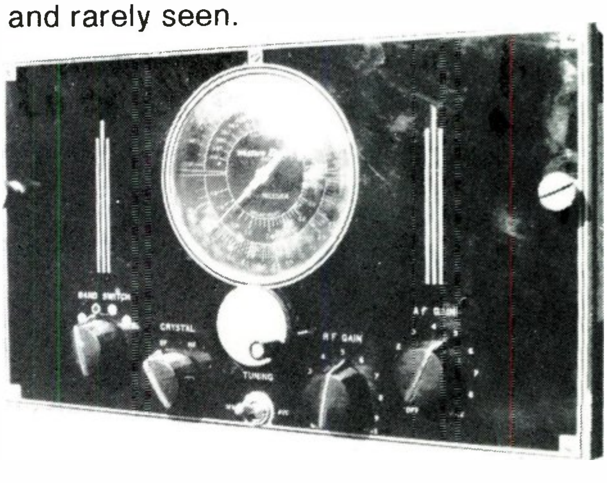
In early 1938 Paul Ware described an inductive tuning system for use in radio receivers. In 1940 he made a number of prototype receivers using the "inductuner" but they were never put into production. Later the system was marketed as the Mallory Inductuner in early TV receivers.



**MODEL:** Inductuner **YRS:** 1940 **BANDS:** 1, 10-60 mHz **REMARKS:** Inductively tuned.

## WESTERN ELECTRIC

Western Electric made specialized communications receivers during the 1930's and WW II. They are little known and rarely seen.

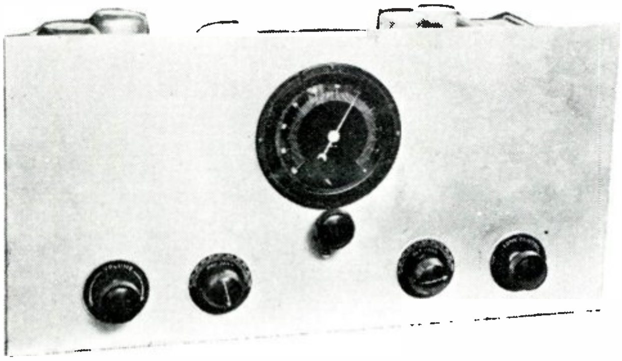


## WESTERN ELECTRIC

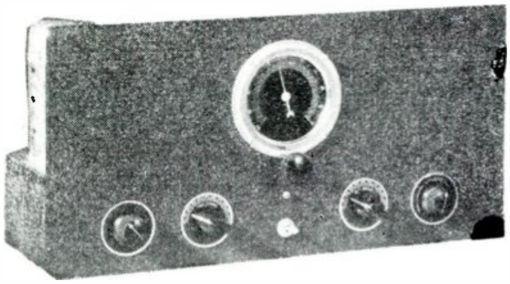
**MODEL:** 20A **YRS:** 1935 **BANDS:** 4, 0.15-18 mHz **FILTER:** Crystal **TUBES:** 5 **REMARKS:** Separate power supply and speaker. Used to test remote BC installations.

## MISC

During 1934 and 1935 a group of eleven component manufacturers sponsored the design of two low priced communications receivers for home construction which were featured in articles and advertisements in all the popular radio magazines.



**MODEL:** All-Star **YRS:** 1934 **BANDS:** 6, .55-30 mHz **IF:** 370 kHz **FILTER:** None **TUBES:** 6, 2A7 conv, 2 58 if, 56 det, 2A5 af out, 5Z3 rect. **REMARKS:** Kit. Plug-in coils.



**MODEL:** All-Star, Jr. **YRS:** 1935 **PRICE:** $27.97 **BANDS:** 6, .54-30 mHz **IF:** 370 kHz **FILTER:** None **TUBES:** 5, 6A7 conv, 6F7 if, 77 det, 42 af out, 80 rect **REMARKS:** Kit. Plug-in coils.

**MODEL:** All-Star, Jr. (Variation) **REMARKS:** A later model incorporated regeneration in the IF stage.

# EPILOGUE

We are about to deliver the last pages to the printer. The quality of the photographs meets our expectations based on the blueprints we have seen of the first 96 pages. So we have half a page left here to fill before we go to press.

As in the previous two editions we have not given a list of the abbreviations, headings and contractions used in the tables since space is at a premium and we hope they will be self-evident to the receiver aficionado. An explanation may be in order for the heading **TYPE**:. This heading is omitted in the case of a straight, single conversion superhet.

I would especially like to thank Floyd Paul and Jim Hanlon for answering my request for information which I was not able to use when the printer accelerated the schedule for the first 96 pages of the book.

There are three publications which have been especially helpful in compiling these books and anyone who enjoys this book will enjoy them. They are: *Antique Radio Classified*, P O Box 2-V118, Carlisle, MA 01741. *Electric Radio*, 14643 County Road G, Cortez, CO 81321-9575. *The Old Timer's Bulletin*, c/o Antique Wireless Assoc, Box E, Breesport, NY 14816.

Other **ACKNOWLEDGEMENTS** are handled in the body of the book either under a picture or in the text as appropriate.

The index mentioned in the preface will not appear because we are closing out at 136 pages which also means we have increased the size of the book by eleven pages rather than nineteen.

Thanks to Marty for her patience as the book has consumed the entire summer and early fall. She also did all the typesetting and much of the proof reading.